

The University of Chicago

A RECONSTRUCTION OF UTO-AZTEKAN HISTORY

A DISSERTATION SUBMITTED TO THE
FACULTY OF THE DIVISION OF THE
SOCIAL SCIENCES IN CANDIDACY FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF ANTHROPOLOGY

1933

By

ROBERT MOWRY ZINGG

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PREFACE

This study is a historical reconstruction of the cultures of the American Indian tribes speaking languages of two branches of the Uto-Aztekan linguistic stock, the Shoshonean and the Sonoran. Discussion is confined to peoples of the one linguistic stock because as all of these languages are genetically related, their history carries back to an original language. The close relation of language and culture is such that if a people once spoke a common language, at that time they shared a common culture.

All history is a reconstruction from primary sources, but this is a reconstruction of history in a special sense because none of the tribes involved had reached the literate level in human civilization. Hence there are no written documents of aboriginal history. Most of the material for this reconstruction comes from archaeological remains which yield, perhaps, the most satisfactory historical data at the pre-literate level.

The ethnographic data of the various tribes has been examined to determine how much or little the present cultures of the modern tribes resemble each other, and how much they resemble the archaeological remains found in the same region. Where there is a high correspondence in culture in both ethnographic and archaeological horizons, a historical relationship is posited, on the assumption that, in the absence of affirmative evidence to the contrary, the remains are those of the cultural ancestors of people now living in the region. However, for an

interpretation of historical relationships between the modern cultures themselves as well as with the archaeological material, the similarities must be numerous and specific: i.e., traits and groups of traits must not only be a consequential part of the totality of cultures involved, but also must show a sufficient complexity and objectivity of structure so that there may be reasonable certainty that the similarity is due to historical continuity and not to Elementargedanken, to parallel development or to casual borrowing of a few traits.

The present study is limited to consideration of material culture (including the material remains of social and religious culture) for the following reasons:

1. Only material culture affords archaeological remains.
2. The data of material culture are more objective than social organization and religion, and hence more specifically comparable.
3. Material culture is apparently influenced by factors of inner growth and decay, much less than social organization and religion.

The writer is deeply indebted to Dr. Fay-Cooper Cole, Chairman of the Department, for careful criticism and general suggestions in all stages of the preparation of this paper. Dr. Redfield has been no less generous with his help. The chapters on the Shoshonean Uto-Aztekan should show the benefit of the reading and suggestions of the ethnographers who have recorded most of the data for the Great Basin, Dr. R. H. Lowie, and Dr. I. T. Kelley, of the University of California. For archaeological criticism the author is no less indebted to Dr. Frank H. H. Roberts Jr. of the Bureau of American Ethnology. To my colleague in Tarahumara ethnography, Dr. W. C. Bennett, the author is indebted most of all not only for criticism and suggestions in the problems of the Sonoran field but for the pleasant associations of nine months field work on these problems.

CHAPTER I

A RECONSTRUCTION OF UTO-AZTEKAN HISTORY

The Distribution of Uto-Aztekan Languages and its General Implications.

The Outstanding Differences in Uto-Aztekan Cultures.

Statement of Historical Problems.

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Précis of Methods and Results of this Study.

CHAPTER I

A RECONSTRUCTION OF UTO-AZTEKAN HISTORY

The Distribution of Uto-Aztekan Languages and its General Implications

This paper is an attempt to present a historical hypothesis as to certain features of the cultural development of the Uto-Aztekan peoples by correlating modern ethnographical cultures with certain archaeological remains of the Uto-Aztekan region. Since Uto-Aztekan languages are genetically related, it is certain that they represent a development from a "proto-Uto-Aztekan" language which connotes a "proto-Uto-Aztekan" culture, underlying the cultural specialization now seen. What can be ascertained about this "proto-Uto-Aztekan" culture? What were the major events in its change, and what were the directions of its changes into the strikingly divergent cultures of Uto-Aztekan tribes of modern times?

The Uto-Aztekan languages are recognized by Kroeber and Sapir¹ to have divided into three branches: the Shoshonean, Sonoran, and Nahuatlan. Each of these branches comprises languages and dialects obviously more closely related to each other than to those of other branches. This tripartite linguistic division is partly paralleled in other phases of culture.

The Great Basin is the home of Shoshonean Uto-Aztekan tribes speaking three groups of mutually unintelligible languages

¹E. Sapir: Southern Paiute: A Shoshonean Language, pp. 5-6.

differing both phonetically and morphologically.¹ First: the Mono-Bannock group includes Mono, Northern Paiute (Paviotso),² "Snake" of eastern Oregon, and Bannock. These languages are the northernmost representatives of Uto-Aztekan. Farther to the south is the second group of Plateau Shoshonean languages: the Shoshone-Comanche-Koso (Panamint),³ which includes Shoshone proper,⁴ Comanche, Gosiute, in the vicinity of Salt Lake City, and Shikaviyam, spoken in California. The third group of Plateau Shoshonean languages are the mutually intelligible Ute-Chemehuevi dialects of the Four Corners Region⁵ with isolated fragments in California. These include: southern Paiute or Shivwits, Kaibab, and Moapa; the Ute dialects of western Colorado and most of Utah; Kawaiisu, spoken in south central California; and Chemehuevi, in southeastern California along the Colorado River. The Chemehuevi are probably a band of southern Paiutes who have been subjected to strong influences from the Yuman tribes of the lower Colorado River.

The southern Californian Uto-Aztekan speak two groups of mutually unintelligible Shoshonean languages. Tutatulabal, or

¹Op. cit.

²R. H. Lowie: "Notes on Shoshonean Ethnography," A.P.A. M.N.H. Vol. 20 (1924).

I. T. Kelley: "Ethnography of the Surprise Valley Paiute" U.C.P.A.A.E. Vol. 31, pp. 69-210 (1932).

These two reports give the best material on the culture of the northern Paiutes.

³F. V. Coville: "The Panamint Indians of California," American Anthropologist, Vol. V, p. 351.

A short account giving a sketch of the culture of this tribe. Valuable notes in ethno-botany.

⁴R. Lowie: "The Northern Shoshone," A. P. A. M. N. H., Vol. XX, pp. 190-313.

⁵The Four Corner Region is a convenient designation for the region where Colorado, Utah, New Mexico, and Arizona meet.

Kern River language, is spoken in south central California. The Mission Indians of southern California proper speak the Serrano dialects, the dialects of the San Luiseno-Cahuilla branch, and the Gabrielino dialects.¹ These California languages and dialects are more specialized and differentiated than those of the Plateau groups.

The area of distribution of the Sonoran Uto-Aztekan is separated from the Shoshonean Californians by a narrow wedge of Yuman-speaking tribes in the lower Colorado River Valley. The Sonoran Uto-Aztekan have their northernmost extension in the Pima-Papago tribes of southern Arizona. This linguistic division extends southward in a continuous distribution down the Sierra Madre as far as Jalisco.² The Sonoran Uto-Aztekan tribes include in addition to the Pima-Papago: the Mayo, Opata, Yaqui, Tarahumara, Tubar, Acazee, Zoe, Nio, Zacateco, Tepejuane, Cazcan, Cora, Huichol, and Tepecano.

The Nahuatlan division includes the Aztecs of the Valley of Mexico as well as isolated groups of peoples in southern Mexico and Central America; the Pipils, Niquiran, and Sigua.

This extensive area of distribution of the Uto-Aztekan languages from northern Nevada to southern Mexico has great historical significance. Within this stock linguistic studies now under way are showing many precise historical relationships which doubtless will throw much light on archaeological and distributional sequences. On the assumption that the prehistoric population of America migrated from Asia by way of the Behring Strait,

¹A. L. Kroeber: Handbook of the Indians of California. An excellent source of ethnographic material. Full bibliography.

²C. Thomas and J. B. Swanton: Indian Language of Mexico and Central America. Map.

this distribution appears to represent a slow but steady thrust down the western Cordillera. It continued down the Sierra Madre as far as the Valley of Mexico. Here the continuous distribution is broken up into scattered fragments farther south. Such a distribution of genetically related languages represents the passage of no inconsiderable period of time to allow for the differentiation of both language and culture from the original "proto-Uto-Aztekan."

Distributed over 1700 miles, this linguistic area presents cultures which suggest a bimodal curve reaching peaks with the Hopi and the Aztec cultures. Within this area, ultimate linguistic relationships are obvious between the lowly "digger" culture of the Paiutes, the typical Pueblo culture of the Hopi, the tribes of northwest Mexico, and the striking civilization of the Aztecs.

The Outstanding Differences in Uto-Aztekan Cultures

All the Shoshonean Uto-Astekans except the Hopi maintain themselves in a desert environment by food-gathering while wandering in family groups. In general, they range in small bands in definite territories in order to exploit the meager resources of wild seeds and roots, jack-rabbits, reptiles, and insects. Their technology is the simplest, consisting of crude shelters, the digging stick, the earth-oven, the rabbit stick, coiled basketry, and rabbit-fur blankets, etc. In the Great Basin, the only social organization larger than the family is the communal hunt under an elected leader. The hunt, and possibly

war, called bands together for dances.

The Uto-Aztekan of southern California are slightly more advanced. They have a similar crude technology, except that they made pottery. The social organization, however, shows clans and moieties. Their religious organization is also slightly more elaborate. Crisis rites, initiation ceremonies, curing and funereal customs are commonly formalized into definite cults.

The Hopi have a typical Pueblo culture on the high mesas of their desert terraine. Here for the first time we find among the Uto-Aztekan intensive aboriginal agriculture. This allows large populations in compact villages. The Hopi have a very complex social organization based on clans and secret societies. The societies have both political and religious functions.

The Sonoran Uto-Aztekan present a gradation from a crude semi-nomadic to a high sedentary culture. The simple nomadic culture is seen in the north among the Papago. The culture increases in elaboration toward the south, where agriculture provides the subsistence. Among the Cora-Huichols contacts with Middle America have produced considerable cultural sophistication. This elaboration of a sub-Mexican source is even more strikingly evidenced in the archaeological level, which shows a distinct sub-Toltec character as far north as Sinaloa and Zacatecas.

The Nahuatlan Uto-Aztekan cultures apparently include the half mythical Toltecan and certainly the Aztecan civilizations which were shattered by the Spaniards. Technology shows high specialization in both cultures. Among the Aztecs, guilds of artisans worked gold, silver, and semi-precious stones into jewels of great beauty. Similar remains are found in Toltec archaeology. Aztec political organization was an imperial confederacy that ruled the highlands of Mexico and maintained a

state which impressed the Spanish conquerers with its magnificence.

Statement of the Historical Problems

Historical Problems in Shoshonean Culture

Despite the striking diversity in the cultures of the Uto-Aztekan, we may assume that there must once have been a "proto-Uto-Aztekan" culture. On the assumption of the Uto-Aztekan migration from the north, evidences of this culture should be looked for among the Shoshoneans, since they had not migrated so far as had the Aztecs. The two-fold problem arises: First, does Shoshonean culture preserve survivals of this "proto-Uto-Aztekan" culture? Second, what archaeological perspective can be found for these surviving patterns in this northern margin of the area of Uto-Aztekan distribution?

Jean Genet has written a Historie des Peuples Shoshones-Azteques,¹ which, like the present work, tentatively accepts the northern provenience of the Uto-Aztekan, ultimately from North-east Asia.² He sets up a proto-Shoshonean period as the first stage in the Uto-Aztekan history, lasting from their arrival in America until 1000 B. C. In the same paragraph, this phase is dismissed as coterminous in space with the Pueblo ruins, "which were built by their descendants or tribes having contacts with them."³ Genet does not discuss or refer to Basket-Maker

¹Jean Genet: Les Editions Genet 199-201 Rue de Grenelle, Paris (VII^e), p. 121. The work is only concerned with the civilized peoples of the Shoshonean (Uto-) Aztekan family. Its treatment of the Shoshonean and Sonoran problems is therefore cursory, and does not duplicate this paper, which is especially concerned with these tribes.

²Ibid., p. 116.

³Ibid., p. 120.

archaeology. Nor does he consider whether this proto-Shoshonean Pueblo culture was brought to the American Southwest in full panoply, or whether it was developed in that region.

Dr. A. V. Kidder, in writing of Basket-Maker culture, recognizes the historical implications of the distribution of Uto-Aztekan in saying: "from the fact that peoples of this speech seemed to have formed the basic population from the highlands of Montana far south to Mexico, it is quite likely that the Basket-Makers belonged to that group."¹ In this paper, an attempt will be made to substantiate this conclusion by showing the high degree of correlation between ancient Basket-Maker culture and that of the surviving Shoshonean Uto-Aztekan. In the light of linguistic distributions, Basket-Maker I material suggests "proto-Uto-Aztekan" culture.

If the historical hypothesis can be established that Basket-Maker I culture is "proto-Uto-Aztekan," other problems emerge. First, what were the events producing the divergent cultures of the Uto-Aztekan tribes of modern times?

Dr. Lowie, whose field work in the Great Basin has saved from oblivion the record of the culture of the Shoshoneans, has briefly compared the social and religious culture of the Great Basin and California.² He concludes that both areas represent a pristine sub-stratum from which Pueblo culture has arisen as a super-structure largely resultant from the introduction of the corn complex from the south. The present paper, dealing with only material culture for which archaeological data are available

¹A. V. Kidder: Introduction to the Study of Southwest Archaeology, p. 118.

²R. H. Lowie: "The Cultural Connections of the California and Plateau Shoshoneans."

for comparison, arrives at the same conception of Southwestern culture history, with the specific implication of Uto-Aztekan participation culminating in modern Hopi culture.

Thus this reconstruction envisages the Great Basin and southern California cultures as modern survivals of the ancient Basket-Maker, which then becomes the earliest "proto-Uto-Aztekan" culture known. In addition, this leads to a conception of modern Pueblo culture as a historical development from the same sub-stratum. This raises the problem whether the Uto-Aztekan Hopi have had a part in the elaboration of Uto-Aztekan culture from Basket-Maker antecedents. Certain general considerations suggest the possibility. Not only are the Hopi, the modern Pueblo group, situated nearest to the classical Basket-Maker archaeological sites, but in their culture they still retain a great emphasis on such Basket-Maker traits as the hunting of rabbits with throwing stick and use of the rabbit net. The Hopi alone among the Pueblos retain the Basket-Maker rabbit-skin blanket, and in their ceremonies still make use of coiled basketry.

Thus the Shoshonean problem is two-fold: First, are the Modern Digger tribes direct survivors of Basket-Maker culture and hence the representatives of "Proto-Uto-Aztekan" culture, which they have maintained with but little change for perhaps two thousand years? Second, can Hopi culture be traced back to the Basket-Maker II sub-stratum?

Historical Problems Presented by the Sonoran Uto-Aztekan

Genet's treatment of the Sonoran Uto-Aztekan is as summary as that of the Shoshoneans. Genet argues that from 1000 to

500 B. C. this main body of the movement progressed in culture and gave rise to one division of people in a "proto-Sonoran period" which built Casa Grande, now a ruin, on the Gila River near Tucson, Arizona. He sets up an "Old Sonoran period" in which the other division of the Sonoran Uto-Aztekan are considered to have built Chachihuites, La Quemada, Totonate, Teul, and Estanzuela.¹

This rigorous synthesis of Sonoran archaeology and ethnography overlooks significant data and most of the problems which they present. Even our very inadequate data are inconsistent with this interpretation at many points. The present author's discovery of a variant of Basket-Maker archaeological material in the Tarahumara country of southern Chihuahua opens the problem: Is Sonoran Uto-Aztekan culture derived from a variant of the "proto-Uto-Aztekan" sub-stratum of Basket-Maker culture? There also arises another problem subsidiary to this: Are the Pima and Papago descendants of the same cultural sub-stratum; or are they survivors of the once high Casa Grande culture?

Data for the other Sonoran Uto-Aztekan are still so scanty that little can be attempted here beyond a classification of the modern cultures into ethnographic sub-areas.

The significant problems presented by the Sonoran Uto-Aztekan are: First, their relationship to "proto-Uto-Aztekan" Basket-Maker remains; second, their historical relationships with each other; third, in their possible relationships to Casas Grandes, as well as the sub-Toltec archaeological sites of La Quemada, Chalchihuites, and the coastal province of Aztatlan;

¹Jean Genet: Op. cit., p. 120.

fourth, as the probable bearers of the cultural exchange between the Southwest and the high aboriginal civilization of Middle America; and fifth, their relationships with Toltec and Aztec cultures.

The Historical Problems Presented by the
Nahuatlán Uto-Aztecs

Genet's work seeks to deal adequately only with the Nahuatlán Uto-Aztecs. The present study will deal summarily with these problems, which despite their interest, are outside its scope. The author agrees with Genet's identification of the half-mythical Toltecs with the Nahuatlán peoples who have spread as far south as Central America.¹ He does not agree with Genet's conception of an "Old Toltec Empire" having succeeded Otomian and Olmecan use of Teotihuacán as a common sanctuary.² Even less reason is seen in the reconstruction of Toltec and Maya-Quiché participation in the culture of Teotihuacán after the migration of the Maya-Quiché down the Mississippi Valley (sic.). The discussion of the "New Toltec Empire" is less hypothetical since it is based on Spanish and native accounts of Aztec legends about these people.

The problems with regard to the Toltecs that arise in this study are: first, were the Toltecs Nahuatlán? Second, what is known of their history? Third, what were the relationships between the Toltec and the Maya?

Genet's study reviews the Spanish and native literature

¹Jean Genet: op. cit., p. 131.

²Ibid., pp. 121, 122.

on Aztec traditional history: The tribes and migrations of the Chichimecans and the reigns of the legendary Aztec kings. Much of the work also deals with the Spanish conquest of Mexico and with Aztec culture as it was recorded in the Spanish sources. These interesting data need not be presented here, except for a summary review of the historicity of the Aztec legends as they throw light on the following problems: Who were the Aztecs? From where did they come? How did they attain to the high culture recorded by the Spanish historians?

Précis of Results of this Reconstruction
of Uto-Aztekan History

The wide-spread distribution of the Shoshoneans in the Great Basin and southern California occurs in a region where the archaeology is well known. That some of this material represents the remains of the people now living in the area is a priori plausible and suggests the possibility of a significant correlation between the archaeology and the aboriginal culture that has survived among these Uto-Aztekan.

A comparison of modern "Digger" Shoshonean material culture with the ancient Basket-Maker remains shows a high degree of similarity in the essential traits of food and subsistence, clothing, personal decoration, household appurtenances, weapons and hunting techniques, ceremonial artifacts, and game paraphernalia.

The archaeologists working in this region have established a basic Basket-Maker horizon as a cultural sub-stratum over an even wider area, which includes most of the Shoshonean Uto-Aztekan distribution. It includes Lovelock Cave in the Humboldt region of northern Nevada, which is the country of the northern Paiutes, and numerous sites in the Four Corners Region, the heart of the southern Paiute country.¹

Basket-Maker I culture is largely postulated by the archaeologists from the Lovelock Cave site. These remains are

¹Other sites in the Basket-Maker horizon, but not in Uto-Aztekan regions are: Tulerosa Cave on the upper Gila River; several caves in the Guadalupe mountains, near the New Mexico-Texas line; the Bluff-Dwellers site in the Ozarks of Benton County, Arkansas; in Brewster County, Texas; in the vicinity of El Paso; and caves in Coahuilla, Mexico. The author's material from southern Chihuahua is in the region of the Sonoran Uto-Aztekan Tarahumaras, and hence involved in this study.

characterized by a lack of corn, and evidence in human feces of an incredibly rough diet of seeds and fibrous plants. Other traits are: twisted fur blankets, tanned buckskin, fiber apron skirt, sandals, moccasins, olivella shells, abalone shell ornaments, twined bags, the digging stick, coiled basketry, the simple drill hearth for fire-making, the metate-mano, the atlatl, fore-shafted dart, rabbit-net, rabbit-clubs, hafted flint and obsidian knives, the figure 4 stick-string trap (?), the tubular pipe, double bone handle for rattle, feather wands, bunches of feathers, and balls suggesting the foot-ball kicking race.

Data are presented to show that Basket-Maker I culture has survived in its main outlines and in many structural details among the Shoshonean Uto-Aztekan of the Great Basin and southern California. Among the 23 traits above listed, 21 are recorded for the Northern Paiutes, and the southern Californians retain the same number. This leads to a conception of ancient Uto-Aztekan participation in Basket-Maker culture. Thus it is suggested that Basket-Maker is the simplest "proto-Uto-Aztekan" culture for which we find evidence.

The term "proto-Uto-Aztekan" culture is used in a special significance in this paper, not as the first or original Uto-Aztekan culture but as the earliest Uto-Aztekan culture as to which we have data. It will be shown as probable that the Uto-Aztekan did not originate Basket-Maker culture, but took it over as an existing, wide-spread cultural horizon participated in by other linguistic groups.

The classical phase of Basket-Maker II shows an advance in technological culture. The following are added to the 23 traits before listed for Basket-Maker I: piñon nuts and rabbits for food, the hoop cradle, coiled trays, bowls, carrying-basket,

the seed-beater, the earth oven, the horn arrow-sizer and wrench, the deer-net noose, medicine bags, bone and stick dice. Of these 35 traits, 29 are found among the southern Paiutes and 30 among the southern Californian Uto-Aztekan.

Several important cultural additions of Basket-Maker II did not reach the marginal survivors. The most significant was corn, since it furnished a new basis for culture. By a controlled food supply, increased population and leisure permitted an elaboration of material culture and possibly of social organization. Other significant additions were: crude experimental unfired pottery; and semi-subterranean, round storage structures of slabs; true weaving; twilled basketry, and the use of feather rope as edgings in fur blanket clothing.

Archaeological evidence shows that the cultural sequence is continuous from the classical Basket-Maker II down to the modern Hopi and other Pueblo tribes. The archaeological data show that Basket-Maker II saw the beginnings of many techniques that developed into characteristic Pueblo features. Such techniques as true weaving, the making of crude unfired pottery, twilled basketry, and the weaving of feather rope for use in cloth become increasingly prominent in the later Pueblo phases of Southwestern history.

Basket-Maker III culture is characterized by a round semi-subterranean dwelling and by true fired pottery with crude black-on-white decoration. The house type is characterized by a central fireplace, a deflector slab, and a sipapu,--features still preserved in the later Pueblo kiva or ceremonial structure. Thus in Basket-Maker II and III are foreshadowed the main patterns of Pueblo culture.

Pueblo I shows other changes. This phase is character-

ized by: a squared house of "jacal" type, the domestication of the turkey, and the use of cotton in weaving. Otherwise it appears as a cultural development of the preceding phase. A change in physical type in this period has prevented the recognition that the early phases of Pueblo culture are derived from the Basket-Maker. It has been commonly overlooked that this is a biological rather than a cultural change. Present knowledge does not establish the necessity for correlation between physical type and culture, despite a recent attempt to revive the possibility.¹ No cultural break occurs in the archaeological sequence to lead to the supposition that the Basket-Makers were killed or driven off. The cultural continuity appears strongly to suggest rather that new-comers of a different physical type appeared, mixed with the population, but modified the culture very little. S. J. Guernsey states the situation conservatively in saying "were it not for the definite break in physical type between Basket-Maker III and Pueblo I periods, we would have an ideal sequence of occupation from the earliest inhabitants to the present day Pueblo Indians. The author does not believe that the Basket-Maker completely lost their identity as a distinct culture through contact with late arrivals in this region. These later peoples took over too many of the distinctive features of the earlier cultures for this to have been the case."²

Pueblo II is the period of the "unit house" with square rooms of masonry showing mastery of the principle of building the square corner. Each house group has a subterranean kiva

¹P. E. Goddard: "The Cultural and Somatic Correlations of Uto-Aztekan," p. 111, 1931.

²S. J. Guernsey: Archaeological Explorations in N. E. Arizona, p. 114, 1931.

reminiscent of the Basket-Maker III dwelling. From this phase evidence is not lacking for the grouping of unit houses as a prelude to the next phase.

Pueblo III represents the full development of Pueblo culture, with dwellings of the entire town in a continuous structure, from which Pueblo culture takes its name. Minor arts reached a high development; and work in pottery, turquoise mosaic, and parrot and macaw feathers give evidence of direct contact with the aboriginal civilizations to the South. This phase appears to have been the golden age of Pueblo culture, before the people were troubled by nomadic warriors, the Spanish conquerers, or American settlers.

Pueblo IV reveals much evidence of shift of population, some of which appears to have been due to the inroads of war-like tribes from the north. The wide range of Pueblo III narrows down to the proportions of the present distribution of the pueblos. At the end of this period occurred the Spanish conquest.

To Pueblo V belongs historic and modern pueblo culture, given Uto-Aztekan representation by the Hopi.

To summarize this reconstruction, it has been assumed that the Uto-Aztekan speaking peoples passed southward from Behring Strait. The data present a conception that they entered an area of a wide-spread, pre-existing Basket-Maker culture, which extended throughout the Southwest several thousand years ago. Much of this culture was taken over and its archaeological remains are the earliest "proto-Uto-Aztekan" culture known. The rear-guard of this movement retained much of this culture in the Great Basin until recent times. Other bands of Uto-Aztekan appear to have taken the Basket-Maker culture into southern

California, where its outlines have been recorded by the ethnographer and the archaeologist.

Subsequently, the introduction of corn into the Southwest freed the ancient Uto-Aztekan of the Four Corners Region from the necessity of a constant search for food in a meager environment. From the increased control of nature thus provided, an elaboration of the pre-existing patterns developed into cultures of Basket-Maker II and III. Despite a change in physical type, a continuity in culture is traceable from this Uto-Aztekan Basket-Maker sub-stratum to the modern Hopi.

The discovery of a variant of Basket-Maker culture in the Tarahumara country of southern Chihuahua suggests that the southern body of the Uto-Aztekan movement brought a phase of this "proto-Uto-Aztekan" culture into the region of the Sonoran Uto-Aztekan. This may indicate Basket-Maker affiliations for Pima-Papago culture.

The hypothesis is advanced that Sonoran Uto-Aztekan culture of modern times is a result of drifts from the sub-stratum of this ancient variant of Basket-Maker culture. The Sonorans probably encountered corn before its diffusion northward, and passed it northward to the Southwest. Every indication is that the Sonorans were in northern Mexico some time before "proto-Uto-Aztekan" culture was being developed into the early Pueblo stages some 2000 years ago.

The sub-stratum of "proto-Uto-Aztekan" culture, as recognized by archaeological remains of Basket-Maker, may have been lost as the people pushed southward through northern Mexico. Along this course they must have received an increasing degree of stimulation from the Archaic or other Middle American cultures of that remote period. A diversity of natural environment also

affected the Sonorans and is reflected in their culture. The differentiation of modern Sonoran Uto-Aztekan culture falls into five sub-areas. The present work uses a statistical expression of similarity to present objectively an approximation of the amount of the drift in these sub-areas.

The non-Basket-Maker archaeological remains are decidedly more advanced than the culture of the surviving Sonoran tribes. The northernmost "Big House" culture of Casa Grande and Casas Grandes appears as a local cultural growth stimulated by the Pueblos of the Southwest and by more frequent trade contacts with Mexico. This culture appears to have died out, since no traces of it are discernible among the Indians of the region at the present time. The so-called "Toltec" sites of La Quemada and Chalchihuites, which are situated about midway to Mexico City, appear to have been frontier or colonial settlements of the higher sub-Mexican cultures either of Jalisco to the south or possibly lower Sinaloa to the west. These regions show a considerable degree of Sonoran Uto-Aztekan participation in Middle American civilization well back in the period called Toltecan. It appears probable that some of this cultural stimulation reached the Uto-Aztekan before the differentiation of Sonoran and Nahuatlan groups.

Mexican cultural impulses comparable to a strong stream affected the southern Sonorans, which is sharply broken toward the north. It penetrated Jalisco and the coastal region of Tepic, and extended north as a narrow salient as far as most of coastal Sinaloa. In northern Mexico no evidence of such a Mexican cultural current appears to have penetrated either the northern Sierra or Sonora-Sinaloa. Mexican influence was effectively blocked by the rugged Sierra and the Cahita peoples of

Sonora.

Middle America influence appears to have penetrated northern Mexico as isolated elements diffused northward through the Sonorans. Important but isolated Mexican traits reached as far as the Pueblos. These traits were given local and characteristic treatment throughout their continuous distribution. Among the Pueblos they have come to function in a thoroughly indigenous context quite different from that at the source. The Sonoran Uto-Aztekan were passive intermediaries for these elements which found strikingly original elaboration in the strongly independent cultural growth of the Pueblos of the Southwest.

The spear-head of the Uto-Aztekan movement was furnished by the Nahuatlan peoples who occupy the region of the Valley of Mexico southward into Central America. The Nahua differ markedly from the Sonoran Uto-Aztekan in their culture, which assimilated most of the elaborations of Middle America. The Nahua were not passive intermediaries, but innovators and conquerers.

General considerations of linguistic distribution and Nahuatlan place-names indicate that the people known in the Aztec legends as Toltecs were Nahuatlan. They probably passed through Jalisco with a cultural equipment already influenced by a marginal variant of the northern radiation of Middle American culture. These people were drawn toward the higher centers of cultural development and extended themselves through the highlands of the Valley of Mexico and south into Central America, where their descendants are the Pipil, Niquiran, and Sigua.

In the Valley of Mexico the Toltecs developed the sophisticated culture known from the Aztec legends and in the archaeological sites of Teotihuacan, Cholula, and Tula. In Central America the Toltecs appear to have strongly impressed elements of

Mexican culture on the New Empire of the Mayas. Architecture, arts, games, and especially religion of the New Empire bear the impress of the Toltecs and suggest that the latter may have come into Yucatan as conquerors.

The Aztecs appear to have been relatively late arrivals into the highly acculturated Valley of Mexico. Not fierce, war-like Chichimecan peoples with a semi-nomadic culture, they appear to have already taken over much of the rudiments of Middle American civilization, even before their separation from the Sonoran Uto-Aztekans. After a passage through Jalisco and Michoacan, in which they developed many of the distinctive features of Aztec culture, their war-like genius enabled them to establish over most of southern Mexico a rigorous and cruel Pax Azteca which was seen and recorded by the Spanish conquerors.

CHAPTER II

"PROTO-UTO-AZTEKAN" CULTURE: A CORRELATION OF MODERN SHOSHONEAN "DIGGER" CULTURE WITH BASKET MAKER I REMAINS

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CHAPTER II
"PROTO-UTO-AZTEKAN" CULTURE: A CORRELATION
OF MODERN SHOSHONEAN "DIGGER" CULTURE
WITH BASKET-MAKER I REMAINS

INTRODUCTORY STATEMENT OF PROBLEMS

This chapter is a comparison of the culture of the modern "Digger" Shoshoneans with the ancient Basket-Maker remains in order to determine the degree to which they are similar. A high degree of similarity would argue for the hypothesis that part of these ancient remains represent "proto-Uto-Aztekan" culture which has survived in many of its essential patterns in the isolated desert region of the Great Basin and southern California.

We should look for evidences of "proto-Uto-Aztekan" culture in the northern segment of Uto-Aztekan distribution on the assumption of a northern provenience for the Uto-Aztekan tribes, ultimately from Asia by way of Behring Straits. Shoshonean "Digger" culture is still one of the simplest in the world. Its very simplicity suggests that it may be a survival of "proto-Uto-Aztekan" Human occupation in the Great Basin is of respectable antiquity. The find near Las Vegas Nevada of Basket-Maker-like darts in a "pre-Basket-Maker"¹ culture with the remains of an ancient extinct sloth Nothrotherium shastense (Sinclair)² gives

¹M. R. Harrington: "The Mystery of Gypsum Cave." Scientific American, July, 1930, Vol. 143, p. 36.

²M. R. Harrington: Gypsum Cave, Nevada. Southwestern Museum Papers No. 8 (1933) gives the complete report on this important find, and an interesting discussion of the antiquity of man in America.

a time perspective more than sufficient to allow for the dispersal and differentiation of the Uto-Aztekan toward the South.¹

Thus is set up a problem within a frame of sufficient time and space for the work attempted. The first task is to project into the simple picture of "Digger" Shoshonean culture, the time perspective of archaeology in the search for evidences of "proto-Uto-Aztekan" culture.

BASKET-MAKER I MATERIAL CULTURE AND
ITS MODERN SURVIVALS

Technology of Food and its Preparation

The Roasting tray and the seed beater

Specialists in Pueblo archaeology "postulate the nomadic period of Basket-Maker I from two widely separated sites,"² not specified, but one of them is Lovelock Cave in northern Nevada³ which gives the best evidence of a Basket-Maker culture without corn. Indeed the remains belie the presence of corn, for direct evidence is found in human feces two inches in diameter of an incredibly coarse human diet of cracked seeds and fibrous vegetable material.⁴ Diagnostic coiled basketry trays are found in nine out of ten cases⁵ with occasional charring indicative of

¹Op. cit. 20,000 years.

²Roberts: Pueblo Ruins in the Piedras District of Colorado, p. 4.

³Loud-Harrington: Lovelock Cave, pp. 119-20.

⁴Ibid., p. 35.

⁵Ibid., p. 66.

the cooking of cracked seeds in the characteristic Shoshonean and ancient southern Californian technique,--of blowing on live coals mixed with cracked seeds in a basket-tray, while keeping the whole from burning by skillfully tumbling them about in the tray.

This significant find of charred coiled basketry trays gives a considerable time perspective to a wide distribution of this characteristic technique among modern tribes, as given by Spier:¹ Havasupi, Pima, Kaibal and Shiviuts (southern Paiutes), Panamint and Paviotoso (northern Paiutes), Lemhi Shosone, Lower Californians, and the southern Californian Luiseño. It is found archaeologically among the Cahuilla,² among whom the pottery of Sonoran derivation via the lower Colorado river tribes has blurred the parching pattern.³

Except for the Havasupi this wide distribution includes all the northern Uto-Aztekan involved in this study. Not exclusively a Uto-Aztekan cultural trait, the technique has apparently diffused north along the Pacific coast to Oregon: the tribes being the Patwin, North Maidu, the Achomahwi, and Klamath.⁴

This simple but fundamental technique of food preparation uniting all the Shoshonean Uto-Aztekan, except the Hopi, is a strong cultural link tying them to the Basket-Maker culture of Lovelock Cave; especially since the distribution of Uto-Aztekan tribes from here in Northern Nevada to Mexico, indicates a great antiquity to their occupation of this northern region, on the

¹Leslie Spier: Havasupi Ethnography, p. 123.

²Campbell: Arch. 29 Palms Region, p. 65.

³A. L. Kroeber: Handbook of California Tribes, p. 703.

⁴Spier: op. cit., p. 123.

generally accepted hypothesis of the population of America from Asia across the Behring Straits. Basket-parching thus appears as a "proto-Uto-Aztekan" trait.

Dr. Spier's scholarly monograph gives this identical distribution of a related technological pattern, largely Uto-Aztekan, i.e., "the method of harvesting wild seeds by beating them with a seed-beater into a basket held with the free hand. This is characteristically the food gathering technique of the Basin tribes and those in adjacent Arizona and southern California. A woven seed-beater is used by the Kaibab Paiutes (Utes), Panamint, Paviotoso, Gosiute, as well as by the non-Uto-Aztekan Maidu, Klamath, Modoc, Achomawi, and Atsugewi."¹ The Cahuillas use a twig seed-beater, the ends of the twigs being held apart by a small hoop.²

It is significant in giving this wide-spread and important food-gathering pattern a considerable antiquity that there has been found a twig form, without the Cahuilla hoop, in the early pre-pueblo ruins of the Kayenta.³ This becomes another link connecting the high Pueblo cultures of the Southwest with this predominately Uto-Aztekan food-gathering peripheral substratum of surviving Basket-Maker I peoples. The seed beater is another "proto-Uto-Aztekan" trait.

The Metate-Mortar Problem

The metate-mortar problem emerges in a consideration of the preparation of seeds for food in this region since seeds are

¹Spier, op. cit., p. 120.

²A. L. Kroeber: Handbook, p. 695.

³Kidder and Guernsey, 1919, p. 120, Pl. 48.

cracked on the metate before parching.

The general distribution of the mortar in North America and its archeological occurrence indicate that it is a primeval trait in this region. Dr. Linton¹ has added to the studies of Dr. Spinden² and others and shown that the wide distribution of metate techniques of the preparation of corn by the use of lye or lime would indicate the diffusion of the metate with the corn complex.

Dr. Spier shows the distribution of the metate as far north as the Modoc and Klamath, and southward among the Paviotoso, Moapa, Kaibab, Mavajo, Havasupi, Yavapai, Mohave, Cahuilla, Cupeño, Luiseño, south Diegueño, Yuma, and other tribes of this southern region.³

The early occurrence of the metate in Lovelock Cave⁴ necessitates special consideration of this northern salient of the metate distribution. There is no evidence that Lovelock Cave, although typologically Basket-Maker I, antedates the corn-metate Basket-Maker II of the Four Corners Region. One's general impression from the Paiute material in the upper levels is that the lower Basket-Maker I levels of the cave represent a culture surviving at the northern periphery of the area, which post-dates the classical Basket-Maker II at the center.⁵

¹Ralph Linton; Significance of Certain Traits in the Corn Complex.

²H. J. Spinden: Origin and Distribution of Agriculture in America.

³Spier: Havasupi Ethnography, p. 120.

⁴Loud-Harrington: Lovelock Cave, p. 138.

⁵In a letter to the author, Mr. M. R. Harrington gives an impression of a similar view of Lovelock Cave material as very likely post-dating the Basket-Maker II in the Kayenta. In the classic Four Corners Region no archaeological evidence of a non-corn, hence Basket-Maker I, culture has been found; but can be postulated on the strong evidence of diffusion of corn from Mexico.

Dr. Sapir applies a linguistic technique to the metate problem;¹ which will be of assistance in this northern area. The northern Paiute in the vicinity of Lovelock Cave call the metate mata,² which is the Paviotoso word mata'³_a; while the Utes in the Moapa region of southern Nevada call the mealing stone mar. The southern Utes Kaibab and Shivwits use the term maratsi; while the Luiseno of southern California say mala-l. In the southern distribution of Uto-Aztekan languages the terms are: Tarahumara ma ta; Huichol mata; and Aztec metlatl.

The stems of all these words yield convincing evidence that the crude flat grinding stones used by the Northern Paiutes represent the same trait as the more sophisticated grooved and legged metate of the Aztecs. But the metate is not considered a "proto-Uto-Aztekan" trait, since the phonetic shift in these words is less than is seen in the more fundamental and intimate words as given by Dr. Kroeber in establishing the genetic relationship of the Uto-Aztekan languages.³ Thus appears linguistic evidence of a culture word diffused with the trait. This was not recent, or we should expect to find either the Mexican-Spanish word "metate" or else a descriptive term as seen among the Luiseno, where the Mexican legged metate introduced by the Spaniards is called ngohilish.⁴

The phonetic shift⁵ in the nomenclature of the simple

¹E. Sapir: Time Perspective in Aboriginal America, p.75.

²Loud-Harrington: Lovelock Cave.

³A. L. Kroeber: "The Shoshonean Dialects of California."

⁴A. L. Kroeber: Handbook of California Indians, p. 653.

⁵"Assimilation in Sonoran and Shoshonean e-a to a-a; spirantization of intervocalic -t to Luiseno -l and southern Paiute -r, the last of which applies to the Shoshone dialects." Sapir, op. cit., p. 75.

slab metate has been sufficient to demonstrate a considerable antiquity for the introduction of the metate in both the Great Basin and California. Thus the linguistic evidence bears out the distributional evidence as well as the archaeological, of an ancient spread of the metate and corn from Middle America where both traits are elaborated into complex contexts.¹

We find in the wide Basket-Maker archaeological horizon distributional evidence which again bears out the linguistic indication of an ancient diffusion of the metate into the Great Basin. In Lovelock Cave at the northern end of the horizon, besides the metate, is a high frequency of the V-shaped mortar of Oregon type, with a long heavy pestle.² Both the mortar and pestle are still used by the northern Paiutes, who call them paha and podanc. The mortar is still used by the North Shoshone;³ while the southern Utes of the Four Corners Region, in close proximity of the corn growing Southwest tribes, appear to use only the metate.⁴

¹The author's interpretation of the corn-metate distribution differs only slightly from that of Dr. Linton who thinks lime-cooking of corn is the diffused Mexican technique, and that the southeast North American use of lye is a survival from an ancient acorn technique. Following the evidence of the corn techniques east to the Ozark Bluff dwellers, the metate disappears. Through the south and eastern United States corn appears to have been fitted into the acorn-seed-mortar pattern with an emphasis on its preparation as mush. Thus the whole tortilla-tamale complex is lost except its basic trait, the cooking of corn kernels with lye or lime. The Mexican use of lye from wood ashes survives among the Lacandones of Yucatan and the Tarahumaras far north in Chihuahua, which indicates to the author, in contrast to Dr. Linton's interpretation of this point, that ash lye cooking of corn is an aboriginal Mexican technique. The author cannot consider the Iroquois use of lye as a survival of a simple acorn technique; because in California, where the possibility of the introduction of the lye-boiling with corn does not obtain, acorns are leached with hot water, without lye.

²Loud-Harrington, Lovelock Cave, p. 140.

³R. H. Lowie, Shoshone, p. 174.

⁴Powell, Exploration of the Colorado, p. 127.

This region furnishes some evidence of the use, millenia ago, of the mortar with a basket-hopper, reported by Pepper from the type-Basket-Maker site of Grand Gulch. But otherwise the mortar seems to have been reduced to a vestigial artifact, 6 inches by 2, and unique, in Pueblo I of the Kayenta.¹

South of the archaeological Pueblo horizon, on the Gila River the Basket-Maker Tulerosa cave described by Hough gave evidence of bed-rock mortars² and the true mortar is reported from Colonial Hohokam at Roosevelt Dam.³ It occurs again at Casas Grandes in Chihuahua. This southern prominence of the mortar cannot be explained in the present lack of knowledge of North Mexican archaeology.

In California, Dr. Kroeber, from both the ethnographic and archaeological evidence concludes that the wood or stone mortar:

Once prevailed over all of California. Then came the metate (brought by the Uto-Aztecan southern Californians, P. 653-4) perhaps from the Southwest, perhaps from the Great Basin. In southern and middle California it became established by the side of the mortar, one implement being used for seeds, the other for acorns. The metate did not come into use in the San Francisco region or the north coast. In the latter region....such as among the North Maidu the metate appears to have influenced the industrial habits to cause the adoption of the slab as a mortar, which, of course, necessitated the use of a basketry hopper.⁴

The conclusion is, that the mortar was a "proto-Uto-Aztecan" trait.

In classical Basket-Maker times the metate appears to have reached the Four Corners Region with corn and may have first modified the mortar into a slab with a basket-hopper as we have

¹Kidder and Guernsey, 1919, p. 124.

²Hough, 1914, p. 4.

³Emil Haurly, A Hohokam Site of the Colonial Period, p. 94, Pl. XXVI.

⁴Kroeber, Handbook of California Indians, p. 413.

seen for the Maidu. More certainly it reduced the mortar to a minor importance for grinding paints and medicinal herbs, roots, etc., displacing it from the whole Basket-Maker horizon as a primary artifact for food-preparation. All our evidence is conclusive that without corn the metate diffused with ever increasing competition with the mortar. To the west it similarly diffused to California, changing the patterns of food preparation as far as central California, ending its course in the Maidu use of the metate as a mortar.¹

Another trait functioning in the metate complex which has largely escaped notice is the metate brush. As a simple bunch of stiff fibers held by a string, it is reported from the Cahuilla² and from the Tarahumara among whom it is used for brushing the last morsel from the metate. One would think that throughout the meager cultures of this desert environment the thrifty pattern of utilizing all the food resources of nature would be expressed in this behavior pattern; but the fragmentary data do not reveal it.

Roots, the Digging Stick, and Earth Oven in Food Preparation

While it has been suggested that the earth oven represents a diffusion from Polynesia to Middle America, this is so

¹There is a logical objection against this hypothesis that immediately arises. Since corn is seen diffusing without the metate to the East and South, it is illogical to reverse the interpretation to say that the metate diffused without corn, which is of course the more valuable of the two traits. The author's opinion is that diffusion is not a logical process. Why did the Negritos take over Malayo-Polynesian language but spurn rice agriculture and pottery? The simplest answer is that they did not wish to shift the whole ecological basis of their culture, however logical that would have been.

²D. P. Barrows, Ethnobotany of the Cahuilla, p. 54.

elementary a trait that the author is inclined to think that it is a primeval method of food preparation, common in Australia, Oceania, and elsewhere.

Pit oven roasting in the north of the Great Basin is the characteristic way of preparing roots,¹ as among the Gosiutes.² The pattern runs throughout the Northwest. But in the Southwest as well, among the non-Pueblo tribes, the earth oven is an important trait for cooking the tough yucca leaves to extract their fiber, and probably for food as well. The more typical food plant for the southwestern earth oven is the mescal (Agave sp.) from which a palatable sweet can thus be obtained. For the mescal-oven Spier gives the distribution for all the Apaches, the Navajo, Paiute, Havasupi, Walapai, Pima, Cahuilla, Huichol;³ and the author found it very important among the Tarahumaras. Here mescal is eaten or dried in large cakes which are used in making an intoxicating liquor. The same custom is common to Mountain Apache, who use a peculiar hatchet, as well as a chisel-edged digging stick.

The cooking of mescal in earth ovens forms another fundamental food pattern linking the Uto-Aztekan Californians⁴ and the Pima, Tarahumara and other southern Uto-Aztekan, as a "proto-Uto-Aztekan" element.

The only clear archaeological evidence of the earth oven in the Basket-Maker horizon comes from Brewster County in the

¹Leslie Spier: Havasupi Ethnography, pp. 119-20.

²R. V. Chamberlain, Ethnobotany of the Gosiute Indians, p. 29.

³Spier: op. cit.

⁴Kroeber: Handbook of California Indians, p. 722.

Big Bend country of Texas,¹ where pieces of roasted "sotol" (Nolina sp. prob.) crowns and other refuse were found. But an indirect indication of such a technique is evidenced from Lovelock Cave at the northern edge of the region where human feces filled with plant fibers were found. This may give a considerable antiquity and the wide distribution of the earth oven technique. The preparation of fiber, food, a delicacy, a sweet, and an intoxicating drink from so incredibly tough and fibrous a plant as mescal, sotol, and agave reveals the amazing adaptability of human culture to an adverse natural environment.

In the most primitive of these cultures in California and the Great Basin an important trait in the food-gathering is the digging-stick, from the use of which many of these tribes were contemptuously called "Digger Indians" by the American pioneers, both in California,² Utah³ and elsewhere.

In Lovelock Cave such a stick was found,⁴ giving considerable antiquity to this trait in the region. The use of the digging-stick is reported for the Northern Paiutes;⁵ it would seem most probable that it was much used, due to the prominence of root gathering with this artifact in this northern region. Lowie reports it for the Wind River Shoshone of Wyoming⁶ and Spier gives it as probable for the Shivwits;⁷ it appears as common for

¹Coffin: Rock Shelter in Brewster County, Texas, 1932, p. 22.

²Kroeber, op. cit., p. 394, mentions the term "Digger" applied to the Maidu.

³Chamberlain, op. cit., p. 29.

⁴Loud-Harrington: Lovelock Cave, p. 95.

⁵Kelly: U.C. PAAB, V. 31, p. 101.

⁶R. H. Lowie: Shoshonean Ethnography, p. 203.

⁷Spier: Havasupi Ethnography, p. 118.

the California tribes.¹ Among the Maidu and Chumash a local elaboration is seen in a stone ring slipped over the tool as a weight. This local development has some antiquity since it is found in the archaeological remains of the Chumash and Uto-Aztekan islanders of the Santa Barbara region.²

The diffusion of the digging stick with corn and the metate has been suggested; but despite the inadequacy of the material, it seems dubious if so rudimentary a device should have needed corn to carry it along. The author would prefer the suggestion that this artifact was ancient in this region and furnished the pattern for the principal tool which was later used in the agriculture of corn. As a planting stick it ran through the higher phases of Southwest culture, until the Spaniards revolutionized aboriginal agriculture with the introduction of oxen and the wooden Spanish-Mexican plow. This implies an amazing conservation in the technology of these people; but this fits into the general picture of the culture.

In the Basket-Maker II and III phases, the planting stick is only slightly differentiated from the digging stick by more careful workmanship into a thin blade-like end. In these sites the sticks are commonly about 40 inches long, enabling planting in a standing position. In the early Pueblo phases, a shorter stick about 20 inches long is more typical, being found in the Kayenta and Mesa Verde. From the vicinity of El Paso, Roberts³ reports the planting stick in the Basket-Maker material. Here there was no other evidence of agriculture than the careful

¹Kroeber: Handbook, p. 735.

²Ibid., p. 935.

³Roberts: Arch. Developments in the Vicinity of El Paso,
p. 13.

workmanship on these sticks, especially in a flattened, pointed end. In the knowledge of the early phases of Southwest archaeology this would appear sufficient as diagnostic of corn, the criterion for distinguishing Basket-Maker I from the later phases.

The only other elaboration on the primeval digging stick, as it was used as a planting stick in recent Pueblo times, is the Zuñi modification by providing a projecting foot-rest resulting in a spade-like tool, which has been taken over by the Navajo.¹

The Archaeological Perspective of Shoshonean Zooculture

The Dog

Since it is certain that pre-Hispanic dogs in America are not related to any American species of coyote or wolf, it seems clear that the early Asiatic immigrants to the New World brought the dog. The evidence of the dog in Lovelock Cave is obscured by the great number of other canine bones, as those of the coyote. There is a possibility of error here, since dog and coyote bones cannot be definitely distinguished. And it seems more likely that the presence of these canine bones is accounted for by the eating of dogs in times of famine, rather than that the wild coyote was ever a staple source of meat. The eating of dogs is a common trait among other Indians, some of whom have a definite ceremonial pattern of dog eating.

¹Leslie Spier, Havasupi Ethnography, p. 118.

Minor Importance of Large Mammals in "proto-Uto-Aztekan" culture

In Lovelock Cave¹ and throughout the archaeological horizon, the plentiful remains of bones of deer, mountain-sheep, and antelope, as well as evidence of use of the horn for artifacts are evidence of the importance of these animals in the subsistence of the Basket-Makers, comparable to that of the living tribes in the region.

The Uto-Aztekan hunt these large mammals, often with decoy masks; but they seem to have only casual ecological value. In the region of Lovelock Cave, the North Paiutes hunted the antelope by running it down;² which is reminiscent of the Papago³ and Tarahumara deer-hunting. But much less strenuously, the gullible antelope could be betrayed by his curiosity and was "charmed" by the music of the rasping stick until trapped into an enclosure and killed in this important ceremonial antelope hunt.⁴

The Gosiute in the Salt Lake City region had communal antelope hunts, in which the animals were driven into V-shaped enclosures.⁵ With the aid of dogs, the Utes to the south hunted the sheep and deer which are common in the Kaibab region.⁶ No record of big-game hunting is given for the Californian Uto-Aztekan; but the nearby Pimas make long journeys occasionally for deer.⁷ The Papago and Tarahumara techniques have been

¹Loud-Harrington, Lovelock Cave, p. 32.

²Lowie, Notes on Shoshone Ethnography, p. 197.

³Carl Lumholtz, New Trails in Mexico, p. 34.

⁴Sarah Hopkins, Life Among the Paiutes.

⁵Chamberlain, Gosiute Ethnobotany, pp. 27-28, 55-57.

⁶Lowie, op. cit., p. 195.

⁷Russell, The Pima Indians, p. 83.

mentioned. Of these southern people, only the Huichol give the deer a pre-eminent place. Here it is again ceremoniously hunted, and the basic patterns of their elaborate symbolic religion are founded on the deer-kill.¹ In general, the larger game seems to be unimportant in the simple technologies of the seed-gathering Shoshoneans; their culture was primarily adjusted to the more abundant plant resources of their environment.

Large game furnished also a utility in buck-skin, tanned with brains. There is indirect evidence that this is an old technique, since bits of tanned buck-skin are found in many of the Basket-Maker sites. But none of them yield any complete articles other than moccasins and leggings; some of them are similar to those of the modern Pueblo women. These are reported by Montgomery² from an unidentified site in the Four Corners Region, and from the Ozark Bluff Dweller site.³ From the Basket-Maker I site of Lovelock Cave comes a beautiful specimen of a moccasin ornamented with olivella shells.⁴

Artifacts of sheep and antelope horn as "proto-Uto-Aztekan" traits link Lovelock Cave with the classical Kane County, Utah, site as well as with modern Paiute peoples. Sheep-horn sickles from both sites⁵ are significant in view of the Paiute pattern of grass-cutting with the sickle.⁶ Horn spoons

¹Carl Lumholtz, Symbolic Art of the Huichols.

²Montgomery: "Prehistoric Man in Utah," The Archaeologist, Vol. II (1894), Nos. 8, 10, 11.

³Harrington, The Ozark Bluff Dwellers, p. 14.

⁴Loud-Harrington, Lovelock Cave, p. 47.

⁵Nusbaum, A Basket Maker Site, p. 123; and Loud-Harrington, op. cit., p. 112.

⁶Lowie, Notes on Shoshonean Ethnography, p. 202.

are found only in these two archaeological sites. The horn sizer or wrench will be discussed elsewhere.

There is a strong suggestion of similarity in curious bone handles, apparently for rattles, found in both Lovelock Cave and the classical Kayenta Basket-Maker site. From the Kayenta region Kidder and Guernsey figure double long bones, carefully worked and decorated with a punctate design and capped with round bone buttons. These are suggested as handles for a rattle.¹ In Lovelock Cave a double bone handle was found associated with rattle horns. The handle was much simpler, made from undecorated humeri of the coyote.² The whole rattle suggests the magic antelope charming, now practiced with the notched stick by the Paiutes.

The Importance of Rabbits in "proto-Uto-Aztekan" Culture

Techniques for the hunting of rabbits are of especial significance in this cultural horizon of the northern Uto-Aztekan because of the importance of rabbits in providing food and in yielding the material from which the diagnostic twisted fur cloth was made. This cultural emphasis noted by ethnographers among the modern peripheral Shoshoneans may be carried back through the entire Basket-Maker horizon. In the meager environment of the Great Basin and southern California, archaeological evidence gives a strong impression that the rabbit was the faunal resource most abundant and most easily utilized by the ancient inhabitants.

In modern "Digger" Shoshonean culture, the rabbit is relatively as important as was the bison in the more elaborate

¹Kidder and Guernsey, 1921, p. 89.

²Loud-Harrington: Lovelock Cave, p. 38.

horse culture of the Plains. Chamberlain writes of the Gosiutes:¹

While antelope, deer, bear, etc. formed scarcely more than an occasional source of sustenance, the jack-rabbit, being exceedingly abundant, was highly important to them and was regularly a chief dependence in the fall for meat, raiment, and blankets.

That the cultural equating of the rabbit and the bison is not far-fetched is shown both by communal hunting and by the fact that the Shoshoneans appointed an official with authority to lead the hunt,² as was done on the Plains for the communal bison hunt--obviously for the identical reason that in both cases the communal hunt was a very important activity. Communal hunts in which the rabbits were driven into nets are reported³ for the Hopi, the Mission Californians, Gosiutes, and the northern Paiutes, as well as many non-Uto-Aztekan tribes of the Southwest, both nomadic and sedentary.

Rabbit-nets, the communal hunting device.-- Archaeological evidence of rabbit-nets is common in Basket-Maker sites. Lovelock Cave yielded much fragmentary netting with mesh suitable for rabbit-nets,⁴ while an incredibly perfect specimen 250 feet long, from the archaeological horizon in the Four Corners Region, is technologically identical with a southern Ute specimen of modern times.⁵ Fragmentary archaeological evidence of the rabbit-net appears to the limits of the archaeological horizon. At the western edge in southern California, a fragment of a rabbit-net was found in an ancient cache-pot in the region of the

¹R. V. Chamberlain, Ethnobotany of the Gosiutes, p. 28.

²R. H. Lowie: Notes on Shoshonean Ethnography, p. 196.

³L. Spier: Havasupi Ethnography, p. 121.

⁴Loud-Harrington: Lovelock Cave, p. 87.

⁵Kidder and Guernsey: 1921, p. 78.

Diegueño;¹ and a very crude fragment is reported from Cahuilla archaeology² nearby. At the extreme southern limit of the horizon, the trait is reported in the cave material from Coahuilla in Mexico.³ Thus it would appear that the rabbit-net pattern of the communal hunt is probably a "proto-Uto-Aztekan" pattern fundamental to the whole archaeological horizon; because it is unlikely that a solitary hunter would put up a net into which to drive a rabbit.

The implement for individual rabbit hunting is the curved rabbit stick reminiscent of the Australian boomerang. It is an artifact typical for the Mission Indians of California,⁴ the Shivwits (southern Utes), the Hopi, as well as non-Uto-Aztekan of the Southwest. Though no record of its use appears among the North Paiutes, it is found in their region in Lovelock Cave.⁵ The archaeological occurrence of the rabbit stick at the northern limit of the Uto-Aztekan area suggests that this artifact may have been a "proto-Uto-Aztekan" trait.

The Basket-Maker II phase of the archaeological horizon yields as typical, a specialized grooved form of the rabbit club found at the type site of Grand Gulch;⁶ and in the Kayenta sites-- Cave I and White Dog Cave.⁷ Outside the Four Corners Region, the grooved club is found in the marginal sites near Luna, New

¹Heye; Aboriginal Pottery in Southern California, p. 45.

²Campbell: Archaeology 29 Palms Region, p. 68.

³Vaillant: 1932, p. 4.

⁴Leslie Spier: Havasupi Ethnography, p. 121.

⁵Loud-Harrington: Lovelock Cave, p. 111.

⁶Pepper: The Ancient Basket-Makers, 1902, p. 7.

⁷Kidder and Guernsey: 1921, pp. 88-9.

Mexico,¹ and from the vicinity of El Paso.²

This specialized form of club has been considered a rabbit stick until recently, when Kidder and Guernsey³ pointed out the striking similarity of this artifact to a grooved club seen in the sculptured form of a Maya warrior from Yucatan. The warrior was represented with the spear-thrower and darts and holding a curved club, similarly grooved, functioning probably to ward off the opponent's darts. The possibility must be kept in mind of the diffusion into the Southwest of a very old Middle American dart complex associating the atlatl, dart, and a grooved club as a defensive weapon. But the present discontinuous distribution inclines the author to the view that this is a convergence in typology between the Maya dart element and a specialized form of the Southwest rabbit stick.

Another factor contributes to this view, contrary to the diffusion thesis. The similarity of form in the Basket-Maker II grooved sticks as found widely distributed in the archaeological horizon, contrast with a high variability in types of dart-throwers. Each archaeological region produces a distinct form of the atlatl: the classical Four Corners Region type⁴ differs from Basket-Maker I, (Lovelock Cave)⁵ as well as from the types of the marginal sites in Brewster County, Texas,⁶ and from the

¹Hough: Tulerosa, 1914, p. 19.

²Roberts: 1929, pp. 11-12.

³Kidder and Guernsey: Explorations, Peabody Museum Papers, Arch. and Ethnol., 1921, p. 89.

⁴Ibid., p. 82, Pl. 33.

⁵Loud-Harrington: Lovelock Cave, p. 100, Fig. 16.

⁶Coffin: Brewster County, 1932, p. 28. Only fragments reported.

Ozark Bluff Dweller site.¹ From the last comes the crudest type of all, directly comparable to the Aztec types from Tenochtitlan itself.² The case for the diffusion of the grooved curved club, as an element of the atlatl complex would be strengthened if the atlatl types were as strikingly conservative as the grooved club. But since this is not the case, and the discontinuous distribution is so great, the author takes the older view that these curved clubs are rabbit sticks.

The Atlatl Dart and Bow-Arrow Problem

The atlatl and dart as "proto-Uto-Aztekan" weapons---

The Basket-Maker I site of Lovelock Cave presents an important problem in the use of the atlatl and bow and arrow in the history of the technology of hunting and war among the Uto-Aztekan.

As mentioned, the atlatl from Lovelock Cave differs considerably from that of the classical and marginal Basket-Maker II; but ovoid stone counter-weights for momentum in propelling the dart are indicated in this site and possibly small stone "charms."³ Complete fore-shafted darts with feathers were not found, but wooden fore-shafts and darts were fairly common; and several perfect fore-shafts with hafted dart-points are illustrated.⁴ This type of dart fore-shaft is a very old pattern, found in the deepest remains of the great sloth in the southern

¹Harrington: 1924, p. 15.

²M. Gamio: "Vestigios del Templo Mayor," Ethos V. I, 8-12 Nov. to Mar. 1920, Mex. 1921.

³Loud-Harrington: Lovelock Cave., p. 113.

⁴Ibid., Pl. 4, c-d.

part of Nevada, associated with other remains of a "pre-Basket-Maker" culture.¹ The fore-shafted dart is typical of both the classical Basket-Maker II² and the peripheral archaeological phases of the horizon. It is found in Tulerosa Cave on the upper Gila³ in the Bluff Dweller culture of Arkansas⁴ and in Brewster County⁵ in the Big Bend country of Texas. An aberrant form of the dart appears as a ceremonial paho from the vicinity of El Paso.⁶

The typical dart of the classical phase of Basket-Maker II, as is found elsewhere, is a reed shaft with split tri-feathering, provided with the diagnostic wooden fore-shaft⁷ obviously functioning to prevent the splitting of the reed-shaft. Many of the fore-shafts are wood or bone bunts, since the ancient Basket-Makers, like their modern representatives, seem not to have wished to risk their stone points on small game that could be killed or stunned with a bunt. Otherwise the fore-shafts are provided with excellent flint or obsidian dart-points, some of them further secured with a covering of pitch. In the world-wide distribution of the dart and dart-thrower, and the high variability of the Basket-Maker atlatl, the essential unity of the dart complex in this archaeological horizon is the fore-shafted and generally feathered dart.

¹Harrington: The Mystery of Gypsum Cave.

²Kidder and Guernsey: 1921, p. 84.

³Hough: Early Pueblos on the Upper Gila, 1914, p. 19.

⁴Harrington: 1924, p. 14.

⁵Coffins: 1932, p. 31.

⁶Roberts: Arch. Dev. in the Vicinity of El Paso, p. 9.

⁷Kidder and Guernsey: 1921, p. 84.

It is significant for this argument that the modern Uto-Aztekan Californians are survivors of an ancient widely-distributed Basket-Maker horizon, since the unique Californian specimens of the dart-thrower and the fore-shafted dart survived among the Chumash and Uto-Aztekan Santa Barbara Islanders until 1760, when Vancouver collected them on the famous voyage of the "Discovery."¹ The dart thrower has two finger holes, a generic Basket-Maker pattern, but is the shortest implement of this nature on record, being only 5-1/8 inches long. O. T. Mason in seeking Mexican affiliations for this unique implement says:² "Were the shaft elongated and the finger holes lengthened to four inches, it would be identical with the Lake Patzcuaro dart-thrower still used to kill water-birds." But in view of the wide Basket-Maker distribution of varied types of dart-throwers, discovered since Mason's writing, the author does not think that it is necessary to go so far afield for affiliations, especially since the Lake Patzcuaro specimens show no greater similarity. Thus affiliations with Basket-Maker archaeology rather than Mexican ethnography are indicated for this California specimen.

The California dart is fore-shafted, but not identical with Basket-Maker fore-shafts; and unfortunately the possibility of typical Basket-Maker tri-feathering cannot be verified, since the end of the dart "is eaten by weevils and broken off." This unique occurrence of the dart-thrower in California gives an impression of the strength of the atlatl pattern among the Uto-Aztekan. This is borne out in the southern extremity of the

¹Charles H. Reed: An Account of a Collection of Ethnography Specimens. Vancouver's Pacific Voyage. JAI, Vol. XXI, pp. 99-108. Pl. XI, Figs. 1 and 2.

²O. T. Mason: "The Throwing Stick in California," Am. Anth., V. 5, o.s. 1892. P. 66.

area since the Aztecs preferred it to the bow and arrow for fighting, and met the approach of Cortez with darts and atlatls.¹ The dart-thrower yields strong suggestion of a "proto-Uto-Aztekan" trait.

Another line of evidence of the strength of the dart pattern among the Uto-Aztekan is the development of the fore-shafted arrow from the Basket-Maker dart.

The development of the fore-shafted arrow from the dart.--
Through the whole Uto-Aztekan area, the ancient fore-shafted tri-feathered dart appears to have furnished the pattern for the arrow, which is only a diminutive dart. In the upper levels of Lovelock Cave are feathered arrows with fore-shafts.² One of these fore-shafts has the extraordinary length of 34 cm. and exhibits the magical "blood-groove," which is seen in the simple arrows of the entire western part of North America.³

The more limited distribution of the fore-shafted arrow is given by Spier:⁴ Yavpai, Tondo, Pima, Cocopa, Pipi, Seri,

¹Mrs. Z. Nuttall: "The Atlatl of Spear-Thrower of the Ancient Mexicans," Arch. and Eth. Papers, Peabody Mus., V. I, No. 3, p. 456.

²Loud-Harrington: Lovelock Cave, p. 97, Pl. 47.

³L. Spier: Havasupi Ethnography, p. 162-4.

From a study of Museum material Dr. Spier extends O. T. Mason's distribution of the "blood-groove arrow" finding it practically universal in western North America.

Several explanations of the "blood-groove" are offered by the Indians. To the Navaajo, Havasupi, and Mandan it represents lightning, which may have significance since they are agricultural to some extent. While to the western Apache, and Pawnees the explanation of blood-channel magic symbolism is given. Other explanations seem to be mere rationalizations.

The extraordinary distribution of this relatively functionless arrow element must be significant of something in human culture, if only of pointless conservatism in taking over a magico-symbolic pattern which commonly loses even such a function.

⁴Ibid., p. 161.

the Indians of Lower California; and together with the simple wood arrow among the Navajo, Havasupi, Apache, Mohave, Yuma, Cahuilla, Panamint, Luiseño, southern Diegueño, and Maidu. The fore-shafted type carries south as the sole form among the Tarahumara and the Huichol. Among the latter it is given meaning in the peyote-deer symbolism.¹

At the extreme north of the Uto-Aztekan area, the old fore-shafted dart pattern was so strong that it was not only carried over to arrows by the Shoshonean tribes; but also the North Paiutes provide their wooden arrow with a perfectly functionless separate fore-shaft,² in the manner of the old reed darts found at Lovelock Cave in the same region. Such evidence should be convincing; either the arrow developed from the ancient Basket-Maker dart in this largely Uto-Aztekan area, or that an introduced arrow was reworked into the dart pattern.

Minor elements in the dart-arrow complex.-- Lovelock Cave gives a Basket-Maker I occurrence to another element of the dart complex which was carried over to arrows and given a wide distribution in the Great Basin and the Plains. This is the horn-sizer or wrench. The Lovelock Cave specimens³ are also important as a cross tie with the classical Kane County, Utah, site,⁴ the only Basket-Maker II site where the dart association with the horn wrench is conclusive, since no evidence of bow and arrow appears. In the classical Kayenta region, the horn-sizer does not appear until "Cliff house" times when the bow and arrow

¹Carl Lumholtz: Huichol Symbolism.

²Lowie: Notes on Shoshonean Ethnography, p. 246.

³Loud-Harrington: Lovelock Cave, p. 42.

⁴Nusbaum: 1932, p. 123, Pl. LXI.

were in use.¹

Associated with the arrow, the horn-sizer or wrench has a wide distribution in North America. O. T. Mason ascribes it to the Plains, the West Coast tribes, and the Esquimo; while Spier records the form from mountain-sheep horn from the Navajo, the Cheyenne, the Havasupi, and the Ute. The Hopi use the same trait in antelope or goat horn. This sizer or wrench is of significance in linking the modern tribes, including Uto-Aztekan like the Hopi, with the Kane County Basket-Maker II site, especially in the absence of this trait, and a minor prominence of horn artifacts in the remainder of the archaeological horizon.

Among the southern Uto-Aztekan where the horn-wrench arrow-straightener is not available, due to absence of mountain sheep for one reason, the reed arrow is polished and straightened with a beautifully finished grooved stone arrow-straightener, often with striated incised decorations.

It seems significant that in northern California the Yurok² and the Modoc³ use a perforated wood arrow-straightener generically similar to the horn sizers, while the southern Uto-Aztekan form of the Cahuilla and the Diegueño⁴ is the grooved stone artifact, sometimes of steatite and often with striated incised decoration.

Well made grooved arrow-straighteners with incised striated decoration were found in the prehistoric Tarahumara archeological phase. The appearance of these fine specimens in

¹L. Spier: Havasupi Ethnography, p. 161.

²A. L. Kroeber: Handbook, p. 90, Pl. 16.

³Ibid., p. 332.

⁴Ibid., p. 530, Pl. 49.

an otherwise rude stone culture suggests that they may be trade pieces. They need not have come from California, though the association with the reed-arrow in both regions strengthens such an implication in the lack of data of possible other affiliations of the artifact.

The simple, sinew-backed, and compound bow has already been adequately treated elsewhere¹ and need not be discussed here other than to point out that the simple bow seems to have followed the Basket-Maker atlatl possibly in the Post-Basket-Maker or in the early Pueblo phases. The sinew-backed bow occurs archaeologically only at Lovelock Cave,² which adds to the suggestion of a northern parvenience of this specialization or simplification of the compound bow. The actual compound bow of mountain sheep horn is found among some of the southern Paiutes. Recency is suggested as it is not found in the archaeological sites.

Animal Traps and Archaeological Antiquity

Stick and string figure 4 trap.-- Lovelock Cave opens the possibility of an early occurrence of the stick and string figure 4 deadfall trap of wide distribution as far south as the Tarahumaras. In Northern Nevada are archaeological remains of "twigs wrapped or knotted"³ which may be remains of this trap still used by the North Paiutes.⁴ The same type is apparently

¹L. Spier: Havasupi Ethnography, pp. 158-60, Distribution and Reference.

²Loud-Harrington: Lovelock Cave, p. 97.

³Ibid., pp. 94-5.

⁴R. H. Lowie: Notes on Shoshonean Ethnography, p. 199.

reported for the Wind River Shoshones. Spier illustrated the trap for the Havasup¹ and reports it for the Hopi and Navajo. From the California Uto-Aztekan occasional deadfalls for rodents are mentioned, but the information is not specific except for the Luiseno, where the trap is based on quite another principle.²

For Basket-Maker II, Kidder and Guernsey show a carefully worked grooved stick similar to Spier's illustration and the Tarahumara trap. This stick is described:³

A carefully worked piece of twig with a small groove encircling one end.... From Grand Gulch are a number of this nature tied together in pairs with strings which are set in the grooves. The length is 6-7/8 inches.

The distribution of the stick and string figure 4 trap from northern Nevada, through the Hopi and Navajo to southern Chihuahua may bear out the interpretation of these grooved sticks as parts of this type of trap, and give an ancient occurrence for this trait, which may be "proto-Uto-Aztekan."

Snare traps.-- Snare traps are important in the modern cultural horizon, net and noose snares being reported generally without specific detail either in California or the Great Basin. The same lack of specific data is found in the archaeological horizon. Fragments of netting suggesting snares are of wide archaeological distribution; but only from the classical site of Kane County does there appear a perfect rabbit net-snare, as well as twig loop snares.⁴ From Lovelock Cave another type of bent twig snare is illustrated.⁵

¹Leslie Spier: op. cit., pp. 113, 121.

²A. L. Kroeber: Handbook, p. 817. "Two stones held apart by a short stick standing on an acorn."

³Kidder and Guernsey: 1919, p. 187; fig. 83, p. 186.

⁴Nusbaum, 1921, pp. 145, 144.

⁵Loud-Harrington: Lovelock Cave, Pl. 48.

From the Kayenta region of the classical Basket-Maker phase is reported a large loop for a deer-noose, attached to a fragment of netting, comparable to the deer-noose snare of the Pomo, Yahi, and southern Uto-Aztekan Huichols.¹ Among the last it is associated in the deer ceremonial so important in their religion; and upon the efficacy of which trap the Huichols conceive that the procession of the seasons and the coming of the necessary rain is dependent.²

Basket-Maker Clothing and Personal Decoration and Modern Survivals

Rabbit-skin blankets.--- It has already been suggested that the rabbit was of unusual importance in providing the material for the twisted fur clothing and blankets. These are found throughout the archaeological Basket-Maker as well as the ethnographic horizons. More than a "proto-Uto-Aztekan" trait, its distribution extends north as far as the Athabaskans.

Commonly twisted fur fabric appears to have been made, as is described by Lowie for the North Paiute.³

In skinning jack-rabbits without a knife, he began with the legs just above the feet, tearing the skin there and uncovering the legs.... With a knife in his mouth he then split the rabbit skin until he had a strip about 9½ feet long. This he tied to another, making a doubled rope, which he twisted around a twig on his thigh, while a young man held the other end. (This stick was apparently later taken out.)

For the weaving four posts were set in the ground in the form of a rectangle, and connected by two cross-pieces, the

¹Kidder and Guernsey: 1921, pp. 79-80.

²Carl Lumholtz: Unknown Mexico, Vol. II, p. 41.

³R. H. Lowie: Notes on Shoshonean Ethnography, p. 228.

strips [of twisted rabbit-fur] being passed from one to the other and new ones tied on whenever necessary.

On this primitive loom set-up the rabbit-fur warp is apparently not woven, but a pair of weft fibers are twined into the fur warp, every two inches. From the archaeological horizon the method of twining these robes has been reconstructed by a careful study of the finished material; and practically the same method is arrived at in the studies of this nature by Kidder and Guernsey.¹

This simplest of textile looms of upright sticks and cross-pieces is the pattern still kept by the Tarahumara in their horizontal looms for true weaving, and corresponds to earliest historical accounts in Northwest Mexico.² The North Paiute horizontal frame for twining fur blankets may well be a survival of a Basket-Maker pattern for the loom of true weaving in this wide region; however, in Basket-Maker II and III arose the notion of setting up warps of spun fiber into two alternate sheds, which is the essential minimum of true weaving.

Several variations of fur warp are so general that a careful analysis yields no specific historical results. Generally tough skins, like that of the badger, which do not need support, are simply twisted on themselves. Differing from the Paiute description commonly in both the ethnographic and archaeological horizons, rabbit fur is twisted around a bast or fiber

¹Kidder and Guernsey: 1921, p. 75.

Mr. Guernsey (1931) has changed his mind about the method of prehistoric twining of rabbit fur blankets and thinks that this would be very difficult and almost impossible. He suggests a method of twining the loops of the fur robe while hanging pendent. This appears to offer the greater difficulty in making the accurate work that is seen in these ancient blankets, especially since the horizontal loom is sufficiently simple for the modern Paiutes.

²Fr. Padre Andres Perez de Ribas, 1645, p. 574.

cord (often two-ply, as are the weft fibers). Sometimes small bits of mouse or other fine skins are twisted directly into the basic fiber.

Techniques of feather blankets.-- Blankets of feathers of wild birds appear in Lovelock Cave.¹ They follow the rabbit-fur technique of twisting thin sections of downy bird-skin over a fiber string. Tough heron skin is twisted without a fiber base. It is significant that the more sophisticated feather technique of Pueblo I is not found in the Basket-Maker I site of Nevada.

String aprons.-- The diagnostic string fiber aprons are found in Lovelock Cave,² as elsewhere throughout the archaeological horizon. As among the historic California tribes,³ and the northern Paiute,⁴ this skirt is indicated as the earliest woman's garment throughout the area.

Moccasins and Sandals.-- Moccasins are rare in the Basket-Maker horizon. Sandals are characteristic of the archaeological horizon, surviving to a lesser prominence in the ethnographic area. Both distributions of sandals through the Uto-Aztekan area suggest eventual and ancient relationships with Mexico. Sandals in the Northern archaeological area are highly variable, but among the numerous specialized patterns is one type of wide distribution based on the technological principle

¹Loud-Harrington: Lovelock Cave, pp. 51-52.

²Ibid., p. 53.

³A. L. Kroeber: Handbook, p. 804.

⁴I. T. Kelly: "Ethnography of the Surprise Valley Paiute," p. 106.

of weaving the weft fibers over a warp bundle formed of several leaves of fibers, shaped to fit the foot.

This type, while rare in the classical Basket-Maker horizon,¹ is typical of Pueblo I, being Kidder and Guernsey's type Ib² for the "cliff dweller" culture. The same technological principle is found in sandals from the Basket-Maker Tulerosa Cave³ on the upper Gila, is reported from the vicinity of El Paso,⁴ and is seen in the "fish-tail" sandals from the Guadalupe Mountains⁵ near the New Mexico state line. The southern limit of the distribution is in Cave Valley in the Casas Grandes area in Northwest Chihuahua and Sonora.⁶

This type has survived from the ancient Basket-Makers to the present Shoshoneans in both the Great Basin and southern California. Lowie illustrates it for the Shivwits (southern Utes) at Shem⁷ and refers to it among the Moapa; while among the southern Californian Uto-Aztekan, it is reported for the Serrano.⁸ The same type is illustrated and described from the Cahuilla by Kroeber:⁹

It would appear that the fibers are bent around a cord, which follows the outline of the foot....and fastened along the middle of the sandal.

¹Roberts: Arch. Dev. Vic. El Paso, pp. 6-8.

²Kidder and Guernsey, 1919, p. 103, Pl. 38c.

³Hough: 1914, p. 83, fig. 173.

⁴Roberts: op. cit.

⁵E. B. Howard: 1931, pp. 199-200, Pl. XXIX, XXXIV, XXXV.

⁶Lumholtz: Unknown Mexico, Vol. I, pp. 68-9.

⁷Lowie: Notes, p. 218, Pl. 5a.

⁸Benedict: 1924, p. 389.

⁹Kroeber: Cahuilla Ethnography, p. 60, Pl. 10.

Head ornaments.-- The classical Basket-Maker phase yields a compound bone hairpin, apparently a head decoration,¹ which finds analogies far through the marginal horizon. It is reported in wood from Coahuilla in northern Mexico; while about midway between these two regions, in the vicinity of El Paso, a similarly bound bunch of sticks was found attached to a "paho"² dart shaft.

The Basket-Maker pictographs in the Four Corners Region depict typical square-shoulder figures with objects projecting from their heads as ornaments. But even more convincing of this use of the artifacts is the survival of the trait among the modern Utes with identical function. Kidder and Guernsey³ show that:

In the Peabody Museum there is a Paiute "warrior's plume" made of five wooden pins placed side by side and held together by colored strings woven about them in such a way as to produce a simple pattern; this specimen is not feathered but is otherwise much like those from White Dog cave.

Powell figures, but unfortunately does not describe, a Ute (southern Paiute) man wearing a headdress suggesting Basket-Maker hairpin head ornaments.⁴ So it seems justifiable to admit this trait as another hint that the modern Shoshoneans of the same region are the marginal survivors of the ancient Basket-Makers.

From Lovelock Cave are reported hair nets, one being found with a quantity of hair.⁵ In California the hair net is

¹Kidder and Guernsey: 1921, pp. 51-2, Pl. 18.

²Roberts: Recent Arch. Developments in the Vicinity of El Paso, p. 10.

³Kidder and Guernsey: op. cit.

⁴J. W. Powell: Exploration of the Colorado River, 1875, p. 104.

⁵Loud-Harrington: Lovelock Cave, p. 91, Pl. 41c.

worn, but not by the southern Uto-Aztekan Californians. Kroeber says that the men's hair net is distributed to the exclusion of the women's basketry-cap.¹ An archaeological occurrence of the hair net in the San Joaquin Valley is found with a mode of hair dress specifically of modern Colorado River style.² The only other archaeological evidence of the hair net is in the author's Rio Fuerte Basket-Maker. Here in southern Chihuahua was found an ancient specimen practically identical with California nets inspected in the Field Museum of Chicago. The present Tarahumaras no longer use the hair net, nor was there evidence of it in the prehistoric archaeological material. This is not conclusive, since most of the prehistoric material had been badly damaged by vandals. As a possible generic similarity among the Huichols, a more elaborate net hair dress is worn. It is called wi-pi' (net) and is thus described by Lumholtz:³

A head-dress....which carries one back to pre-Columbian times. It is an oval network of fiber adorned at each end with a modern rectangular piece of flannel. It was put on the head lengthwise, a head-band passing over the two ends to keep it in place.

The finding of a California type of hair net in southern Chihuahua Basket-Maker is difficult to explain otherwise than an ancient pattern of wide distribution. While our evidence for such an explanation is inadequate, the prominence of fragmentary netting suitable for hair nets in the whole Basket-Maker horizon gives some evidence for such an interpretation.

¹A. L. Kroeber: Handbook of California Indians, p. 808, Pl. 55.

²Ibid., p. 934, Pl. 72.

³Carl Lumholtz: Unknown Mexico, Vol. II, p. 60.

Shelters and Structures

There seems to be no correlation between the ethnographic phases in house types. There is certainly none with the archaeological horizon, since no structure with a hearth has been found in the Basket-Maker I and II. This lack of evidence of dwellings in the ancient horizon is not surprising since the scantiest brush or tule shelters suffice most of the inhabitants of the Great Basin. The North Paiute in the Humbolt region of Lovelock Cave have the sketchiest of dwellings furnished by a round tule lodge similar to the brush form among the southern Utes, both described by Lowie;¹ and essentially the same as the illustration of the southern Ute (Shivwits) settlement of 1875.²

An early statement by Dellenbaugh for the Kaibab Utes³ reveals a round hogan-type of dwelling of cedar posts which Lowie found among the Utes of Moapa to be called mo-ya'-qan.

The historical house type among the Cahuilla is a mat jacal but shows so much Spanish-Mexican influence as to preclude any consideration of historical consideration.⁴

Thus the lack of dwellings in the archaeological Basket-Maker II is not surprising. The Southwest archaeologists appear to be justified in postulating dwellings of this phase to have been of very perishable nature with habitation in natural caves as very probable. The Tarahumaras still characteristically have recourse to caves during the cold winter months. Among the

¹R. H. Lowie: Notes on Shoshonean Ethnography, pp. 220-21, Figs. 8-9.

²Powell: Exploration of the Colorado River, 1875, p. 126.

³Dellenbaugh: A Canyon Voyage, New York, 1908.

⁴A. L. Kroeber: Handbook of the California Indians, p. 793.

Tarahumara, cave dwelling appears more pronounced in the pre-historic phase and seems to continue back to the Basket-Maker culture, which corresponds to the wide Basket-Maker horizon in the absence of dwellings but in the use of caves for storage and burial.

Notwithstanding the lack of evidence of hearths in the Basket-Maker horizon abundant evidence of fire making occurs, and the universal method is the simple stick-drill and hearth.

Storage and burial in the Basket-Maker horizon.--- While evidence of dwellings in Basket-Maker culture is almost a blank, most of the sites reveal pot-shaped excavations so definitely formed as to conclusively indicate storage structures, often given a secondary use for burial, characteristically with a large coiled hamper for a cover.

In Basket-Maker I, Lovelock Cave, 40 such pits were found, 8 of which contained burials.¹ They appear to have been dug during all the time of the cave's occupancy. One of them contained a remarkable cache of tule decoy ducks² of modern Paiute type.³ This and many other elements show a gradual shift from the lower Basket-Maker I levels to the modern Paiute culture. This is interpreted by Harrington⁴ as a gradual rather than a sudden change indicative of a late migration. The evidence indicates to the author a development of early Uto-Aztekan Basket-maker into modern Paiute, when taking into account the north

¹Loud-Harrington: Lovelock Cave, p. 9.

²Ibid., p. 12.

³R. H. Lowie: Notes on Shoshonean Ethnography, p. 198, Fig. 1.

⁴Loud-Harrington: op. cit. Discussion of stratigraphic section, pp. 18-28. Probable history of the cave, p. 119.

and south distribution of Uto-Aztekan languages on the assumption of the population of America from Asia, by way of the Behring Straits.

Household Appurtenances

Knives.--- Due to the dry conditions suitable for the preservation of material culture, Lovelock Cave provides a characteristic Basket-Maker trait in a stone knife hafted with pitch in a wooden handle. One of the Lovelock knives is of unusually opaque obsidian,¹ a common Basket-Maker material. Several typical wood handles were found without blades,² while very similar artifacts were recognized by Paiute workmen as net-weavers.³ A very thin knife blade, of very different type and 27 cm. long, suggests relationships with the ceremonial knife blades of northwest California.⁴

From the classical site in Kane County, Utah, was found a perfect hafted knife but with the haft covered with pitch, making it impossible to determine whether it was tanged,⁵ a feature considered typical for the classical Kayenta. These knives look like large "lance-heads" but one of them was found so hafted as to identify them all as knives.⁶

¹Op. cit., p. 108.

²Ibid., p. 100.

³Ibid.

⁴Ibid., p. 108.

⁵Nusbaum, 1922, p. 127, Fig. 123.

⁶Kidder and Guernsey: 1921, p. 94, Pl. 35.

From the marginal Basket-Maker, Hough illustrates a plain hafted knife from Tulerosa Cave¹ which does not have the tanged barbs of the classic tanged knife. These appear clearly as an elaboration in the classical phase, which in so many other details proves itself a more specialized and higher culture than the remainder of the archaeological horizon. This sophistication is again seen in the knife handle figured by Kidder and Guernsey.² The butt of this knife curves and terminates in a neatly finished end, which is duplicated in two less well-preserved specimens.

The general Basket-Maker type of untanged hafted knife with flint or obsidian blade and plain handle survived among the modern Utes, from whom specimens were collected by Powell in 1878 from the Kaibab, but noted also among the Shivwits.³ The survival of this trait with others, such as identical rabbit-nets, and bone hairpin head dress, among these nearby Uto-Aztekan is significant for the thesis that they are descendants of ancestral Basket-Maker bands. Others of these bands took over corn, and elaborated their common seed-gathering coiled basketry and fur and feather clothing culture into the more sophisticated Basket-Maker II; and with a slow but steady development passed through the Pueblo phases into the present Uto-Aztekan Hopi culture.

Other stone tools.--- The lack of woodworking in the Basket-Maker horizon is reflected in the stonework. Grooved stone axes are lacking in the Basket-Maker horizon (p.149-50) and do not appear until the early Pueblo phases. Plain, chipped

¹Hough: 1914, p. 21, Fig. 138.

²Kidder and Guernsey: 1921, p. 94, Pl. 35.

³W. J. Hoffman: The Menomini Indians, 14 Ann. Rep. BAE, p. 283, Figs. 52-53.

ungrooved axes occur to a degree in Basket-Maker III. Commoner are such general aboriginal tools as hammer stones, and sandstone grinders and polishers, which have little specific historical value.

Bone implements.--- Bone awls are not uncommon in the Basket-Maker horizon, and they must have been important tools in the sewing of coiled basketry. Little historical emphasis can be placed on the general patterns, but Harrington notes that while the typological similarity of the Lovelock Cave specimens is not close, still Southwest rather than Californian affiliations are suggested.¹ Not until Basket-Maker III does a bone needle with an eye appear.²

Scrapers of long bones with worn sides, suggesting beamers to function in the skin-working complex, are found throughout the Basket-Maker and post-Basket-Maker³ horizons, and are found also in California.⁴ This trait is so general in the Plains and elsewhere that little specific value can be attached to it.

Lovelock Cave yields a notched scraper of deer-scapula which cross-ties with the California Bay shell mounds.⁵ A Paiute workman said it was probably used for scraping greasewood in making awls and arrow-fore-shafts; but one suspects the possibility of the rasping stick which is used by the Paiutes in "charm-

¹Loud-Harrington: Lovelock Cave, p. 37.

²Roberts: 1929, pp. 130-31, Pl. 25; Kidder and Guernsey: 1919, Pp. 153-54, Pl. 64.

³S. J. Guernsey: 1931, p. 84, Pl. 56.

⁴A. L. Kroeber: Handbook of California Indians, p. 417.

⁵Loud-Harrington: op. cit., p. 40.

ing" antelope and is seen in California among the Salians.¹ A similar instrument in the stick form was found in the archaeological site in Brewster County, Texas.² The notched rasping stick is common among the Sonoran Uto-Aztekan, being used by the Tarahumaras and the Huichols in the peyote cult.

Cradles.-- The suggestion of a cradle seen in Lovelock Cave in peeled willow sticks is a unique type, if it is in fact a cradle.³ The rigid type of cradle of Basket-Maker II involves a technological principle of wide distribution among the present peoples of the Great Basin and northern California. A rigid ellipsoid hoop, single or double, like a withe or a hardwood stick supports the body of the cradle made of vertical and transverse rods or reeds. In the classical Basket-Maker phase, a fragmentary specimen is illustrated with a body of criss-cross rods,⁴ as well as others of reeds attached to the ellipsoid frame by narrow rawhide thongs.

Among both the northern Paiutes and southern Utes this is the essential structure of the cradles; though, as might be expected in the twine-using area, the rod or reed body is further reinforced by twined weaving, as a specific variation.⁵ In California the same technological principle is seen in the Maidu cradle.⁶ The southern California Uto-Aztekan Indians vary from the Basket-Maker Great Basin pattern by using a ladder type.

¹Kroeber: op. cit., pp. 549, 824.

²E. Coffin: 1932, p. 27.

³Loud-Harrington: op. cit., p. 95.

⁴Kidder and Guernsey: 1919, p. 164, Pl. 71.

⁵Lowie: Notes, p. 250, Fig. 33.

⁶Kroeber: op. cit., p. 535.

This is also seen among the Pima Indians, while the Sonoran Uto-Aztekan Tarahumara and Huichol use none. Nor was any archaeological evidence of it found in southern Chihuahua.

The principle of an ellipsoid with the hoop supporting the body of a cradle appears in Pueblo III archaeology, but with the body woven of twill.¹ Twill work is not surprising since several twilled baskets in the same site show that by this phase of Pueblo development, twilling was competing with coil and twining in basketry techniques.

Basketry and matting.-- Basketry is of especial importance in this problem, since in Shoshonean culture the technology of the gathering, storing and preparing food so prominently involves basketry.

Coiled basketry is an important diagnostic trait of both the archaeological and ethnographic horizons. But in minutia of technique, considerable variation appears even in the classical phase of the Basket-Maker horizon. The typical two-rod and bundle foundation seen in the majority of baskets have numerous variations well discussed by Weltfish.² The classical Kane County, Utah, site stands off from the others quite sharply, since besides the typical two-rod and bundle foundation with plain stitch, it also reveals: bifurcated stitch, single rod with wrapped bundle, and one rod and knotted binder in a fragment of an open-work sifting tray³ of the same technique as Samcan and Fuegan basketry.⁴

¹S. J. Guernsey: 1931, p. 105, Pl. 64.

²Gene Weltfish: "Prehistoric N. American Basketry Techniques and Modern Distributions," Amer. Anth. V. 32, 1930, pp. 486-7.

³Nusbaum; A Basket-Maker Site, 1922, pp. 95-102.

⁴Weltfish: op. cit.

None of the Basket-Maker sites in the Four Corners Region show twined matting except Kane County, which again shows its variation. Here we find twined mats of bundles of grass stems, mashed yucca leaves, cat-tail rushes and juniper bark.¹ In this presence of twined mats, as in a greater prominence of horn artifacts, Kane County Basket-Maker shows itself as intermediate between the other classical Basket-Maker sites and the Basket-Maker I site of Lovelock Cave.

In Lovelock Cave, coiled basketry remains are more frequent than twined (308:104), and a coarse 3-4 rod foundation coil runs consistently from the lowest to the highest levels.² This seems to be related to the three-rod coil reported from the type site of Grand Gulch by Pepper, who compared it to Pomo basketry.³ Weltfish shows the northern affiliations of the three and four rod Lovelock basketry with the Maidu.⁴ The fine coiled ware of the upper levels of Lovelock Cave made on a three rod triangular foundation is found similar to the Pomo work,⁵ while the coarse one rod coiling has its closest affiliations with the classical Basket-Maker type site of Grand Gulch.⁶

But the lower Basket-Maker levels of Lovelock Cave diverge still more from the classical phase in the presence of flexible twined basketry.⁷ Weltfish shows this to be of northern derivation in its similarity with the Pitt River Achomawi and Atsugewi

¹J. Nusbaum: 1922, pp. 95-102.

²Loud-Harrington: op. cit., p. 26.

³Pepper: "The Ancient Basket-Makers," 1902, p. 16.

⁴Weltfish: "Problems in the Study of Ancient and Modern Basket-Makers," Amer. Anth. n.s. Vol. 34, p. 115.

⁵Ibid., pp. 115, 116.

⁶Ibid.

⁷Loud-Harrington: op. cit.

and Klamath twining.¹ The high frequency of twining in Lovelock Cave has no Basket-Maker parallel, except the presence of twined matting in Kane County, Utah.

In Basket-Maker III, loose twined mats used for roof covering appear in the Kayenta, while in Pueblo I appear twined rush and reed mats strongly suggesting northern affiliations.²

This diminution in twined mats from North to South in the Basket-Maker horizon, together with the prominence in Lovelock Cave of twined basketry of northern affiliations, indicates a probability of the diffusion of the technique of twining into the Great Basin and the Southwest from the Northwest Coast, where twining is used almost exclusively. Both the high elaboration and high frequency of twined techniques in Lovelock Cave suggest that chronologically Basket-Maker I culture survived the classical Basket-Maker II phase, where twining is seen only in the post-Basket-Maker and the early Pueblo phases, and never getting to be an elaborate complex in the Southwest.

Corresponding to the diminution of twining against coiling from North to South in the archaeological horizon, the ethnographic distribution reveals the same relative frequency. In the Great Basin, the Shoshoneans developed a unique twilled twining seen in their characteristic basketry artifacts of diagonal twining. Among these Uto-Aztekan peoples of the Great Basin, the frequency of diagonal twining in its north and south distribution shows an attenuation against an increasing frequency of coiled basketry corresponding to that seen in the archaeological horizon.

¹Weltfish: op. cit.

²S. J. Guernsey: 1931, Pl. 58.

Among the Northern Paiute (Paviotoso) Lowie¹ found only three flat-bottomed bowls in coil, whereas most common is the twined work showing a very close affiliation with the nearby Washo.² There is seen a practical duplication in burden baskets, seed-beaters, winnowing trays, and mush-bowls. The non-Basket-Maker twined tule sandals also strongly suggest a Klamath-Modoc pattern.³ This Washo influence is recent, since it is not strongly seen in the upper levels of Lovelock Cave, which are clearly Paviotoso. Washo influence is not seen among the southern Paiutes in the region of the classical Basket-Maker, where the archaeological technique of coiling has been much more conservatively kept.

The westernmost Moapa Utes use the coiled technique in their water-baskets,⁴ which Powell also collected from the Utah Shivwits as well as from the Kaibab Utes. These are described by Mason, together with coiled trays and seed jars of two-rod foundation and interlocking stitches.⁵ A coiled berry basket is reported by Lowie⁶ similar to the open twined type illustrated from the same tribe by Mason.⁷ Lowie concludes from his field and museum study of Shoshonean basketry that:⁸

Baskets definitely known to have come from the Utes are remarkable....for their dearth of twined ware.

¹Lowie: Notes on Shoshonean Ethnography, p. 233.

²Barrett: The Washo Indians, p. 17.

³Barrett: Modoc-Klamath, Pl. 17, fig. 2.

⁴Lowie: op. cit., p. 237.

⁵O. T. Mason: Aboriginal American Basketry, pp. 89-95.

⁶Lowie: op. cit., p. 241.

⁷Mason: op. cit., p. 493, Fig. 182.

⁸Lowie: op. cit., p. 241.

This attenuation of twining toward the south against a higher frequency of the older coiled technique is an ethnographic correlate of the archaeological evidence of a diffusion of twining from the Northwest Coast area into the Great Basin, getting into the Southwest only among the Havasupi. The affiliations of this tribe are shown by Spier to be toward the Basin.¹

The general basic archaeological coiled-basketry pattern remains strongest among the nearby Utes, and the Mission Uto-Aztekan of southern California. Among the latter, the basketry is exclusively coiled, except for crude and experimental twined leaching trays² for acorns, a basket "that seems deliberately crude and unworkmanlike."³

This data on basketry types may thus be summarized. The study of distribution shows coiled basketry from the Athabaskans and Eskimo and even Siberian Koryak to the North, south as far as the Pima. The archaeological perspective gives evidence of the place of basketry in an ancient and simple food-gathering culture all over western North America. Within this area, the cultures of the Northwest Coast developed as a focal center⁴ for other basketry types, as for so many other traits. This region furnished the source of a diffusion of basket and mat twining which strongly penetrated all nearby northern tribes. But this diffusion extended far south throughout the Great Basin, where the basket technique was given a local development as

¹L. Spier: "The cultural Affiliations of the Havasupi," Am. Anth., Vol. 31, p. 213.

²A. L. Kroeber: Ethnography of the Cahuilla, p. 42, Pl.1.

³A. L. Kroeber: Handbook of the California Indians, pp. 700-01.

⁴A. L. Kroeber: 1919, Proc. Inter. Cong. Amer., XIX, p. 399.

twilled twining, seen in the characteristic modern Shoshonean baskets; it found its southern limit among the Havasupi.

The diffusion of twining reached the Four Corners archaeological region in post-Basket-Maker times, and is seen in the early Pueblo phases; but among the Pueblo peoples it has never been more than a minor weaving or decorative element in the baskets of other techniques, and as Mason points out, it is intrusive.¹

In Pueblo culture, basketry techniques have declined since the early high development in Basket-Maker times. This is easily attributable to the development of pottery which has the same functions in the storage, cooking, and transportation of food. The commonest basketry now seen among the Pueblos is a rough, strong, and practical wicker-work. It is impossible from our present knowledge to demonstrate a diffusion of wicker-work from the North by such a method as was used in showing the diffusion of twining, based on a correlation in diminishing frequency of twining against coiling from north to south in both the archaeological and ethnographic horizons.

Still the data suggest northern affiliations for the wicker-work seen in the archaeological Southwest.² There is no prominence of wicker-work to the South, and in northern Mexico twill is the only technological principle used in basketry.

In Lovelock Cave, to the North, wicker-work shows the greatest frequency of all techniques (1115 fragments).³ According to Weltfish, this wicker-work is more like the Pomo work

¹O. T. Mason: Aboriginal American Basketry, p. 499.

²Gene Weltfish: Problems in the Study of Ancient and Modern Basket-Makers, p. 116.

³Loud-Harrington: Lovelock Cave, p. 60.

than like that of modern Hopi or Zuni, but has a border finish that is used occasionally in the Pueblos.¹ This is a suggestion of a northern derivation of Pueblo wicker-work; but, of course, this does not exclude the alternate possibility of a local development of this technique within the Pueblo area.

Fine flexible twined bags, ancient and modern.-- In the Four Corners Region beautifully twined bags of soft spun fiber, decorated both by painting and weaving of a design,² are characteristic of the classical phase of Basket-Maker. These are found both in the Kayenta and at the Kane County site,³ as one of the elements showing the close affiliations of these classical sites. These bags represent the highest development of twined weaving in North America and suggest a local development of the classical phase in keeping with its general higher sophistication. This bag appears to have been developed from the pattern of a cruder type of soft twined bag of wide distribution in the archaeological horizon. The art seems to be on the decline in the Kayenta in the Basket-Maker III phase;⁴ possibly due to the influence of true weaving.

The Basket-Maker I site of Lovelock Cave yields a fine twined flexible bag, brown with black patterns,⁵ which is not further described. Significantly this type was found in the lower two levels with the other materials of strongest Basket-

¹Gene Weltfish: op. cit., p. 116.

²Kidder and Guernsey: 1921, pp. 65-75. Excellent technological account with illustrations.

³Nusbaum, 1922, pp. 104-6, Pl. XVI.

⁴S. J. Guernsey: 1931. p. 79.

⁵Loud-Harrington. Lovelock Cave., p. 26.

Maker affiliations. The wide distribution of the soft twined bag pattern in the Basket-Maker horizon is shown by the finding of "fragments of twined woven bags, closely resembling those of Kidder and Guernsey,"¹ far to the southeast in the Guadalupe Mountain caves near the New Mexico-Texas state line. The southernmost occurrence of the pattern is seen in the bags of double twine weave from the Mexican Coahuilla Cave material² unfortunately never described.

These close-twined bags of string materials prove to be another trait linking the Uto-Aztekan Mission Indians of California with the archaeological Basket-Maker horizon. In California these bags are made of milkweed fiber and are found in California only among the Uto-Aztekan, but outside are shared with the Mohave and Yuma.³ A specimen of alternate bands of twisted juniper and yucca fiber twined "to strongly suggest the Basket-Maker remains" is reported from Cahuilla archaeology⁴ in southern California. It was found two feet or more below the surface with a bundle of coiled splints and without pottery in a perfectly dry cave. This leads Campbell to think that it is very much older than many of the objects found in caves in the Twenty-Nine Palms Region of the Cahuilla.

The south Californian distribution of these twined bags is given considerable time depth by its ancient occurrence in Cahuilla archaeology. This may possibly indicate that the generalized pattern was brought into California by the Uto-Aztekan

¹E. B. Howard: 1931, p. 201.

²Vaillant: 1932, p. 4.

³A. L. Kroeber: Handbook of California Indians, p. 722.

⁴Elizabeth W. Crozer Campbell: 1931, p. 68, Pl. 38.

immigrants in Kroeber's second period of California history,¹ conceived from 500 B. C. to 500 A. D.

An alternate possibility may be convincingly argued in view of the trade in olivella and abalone shell demonstrable between southern California and the Basket-Maker archaeological horizon (see p. 96). This southern California and Colorado twined bag may be a simplified imitation of the classical Basket-Maker bags, one of which was found in an archaeological site as far north as the San Joaquin Valley in California. It is similar to the Diegueño-Mohave bags but "has an especial likeness to the utensils of the Basket-Makers who lived at Grand Gulch, Utah"² --the type Basket-Maker site. The similarity is especially strong since the patterns are worked in with human hair.

This classical Basket-Maker bag was found in archaeological association with other remains that strongly suggest derivation by way of the lower Colorado, where the simple twined bags still exist in the culture.³ The lower Colorado River affiliations are: the potato-masher club of the Mohave⁴ and Southwest;⁵ and a skull with hair plastered in long pencil-like masses which in historic times was the style of the Colorado River tribes, and as far as known of no others.⁶ Thus it may be argued that the twined bags of California and the lower Colorado might have

¹A. L. Kroeber: History of Native Cultures in California, 1923, p. 142.

²A. L. Kroeber: Handbook of the Indians of California, p. 934, Pl. 63.

³Ibid., p. 738.

⁴Ibid., p. 751, called halyahwai and made of mesquite.

⁵Ibid., p. 934.

⁶Ibid.

arisen as a simplified imitation of classical Basket-Maker bags introduced by trade. However, on the whole, the wide distribution of these bags in the archaeological horizon rather suggests variations on a fundamental generalized Basket-Maker pattern.

Too little is known about the function of these twined bags. The Kane County, Utah, bag was found to contain about a quart of sunflower seeds as well as a variety of materials of the spinner's art in thirteen loose hanks of fibers, indicating its use as a work bag.¹ It may be significant that the crude Cahuilla specimen was found associated with basketry splints suggesting the bag again as part of the weaving complex.

¹Nusbaum, 1922, pp. 104-5.

CHAPTER III

"PROTO-UTO-AZTEKAN" CULTURE (Continued):

CEREMONIAL CUSTOMS AS INDICATED BY

MATERIAL REMAINS

Tobacco

The Tobacco complex and archaeological perspective

The tubular pipe: a "proto-Uto-Aztekan" trait

Corn-husk cigarettes and the reed censer

Datura--Jimson weed

Feathered ceremonial artifacts

Medicine bags

Games

Cup and ball game

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The patolli-parchesi problem

Evidences of ancient Shoshonean trade

Evidences of trade from California to the Southwest

Olivella shell

Abalone shell

Evidences of trade from the Southwest to California

Summary and conclusions

CHAPTER III

"PROTO-UTO-AZTEKAN" CULTURE" (Continued):

CEREMONIAL CUSTOMS AS INDICATED BY

MATERIAL REMAINS

A knowledge of Shoshonean ceremonial customs gives some basis for plausible inferences as to the function of certain artifacts in Basket-Maker archaeology. A correlation of the ethnographic data with the ancient remains gives some conception of ceremonial customs in "Proto-Uto-Aztekan" culture.

Tobacco

All evidence proves the antiquity and ceremonial importance of tobacco among the American Indians. This with the botanical evidence indicate an American origin for this important plant now of world-wide ceremonial use. But claimants for an origin of tobacco in other continents arise from time to time¹ to be conclusively answered by the Americanists.²

The distribution of tobacco species in America is significant for the present problem. Setchell's authoritative article makes it clear that most of the species of *Nicotiana* are native to the Cordilleran ranges from the State of Washington

¹Leo Wiener: Africa and the Discovery of America, Vol. I, 1920, Philadelphia.

²Roland B. Dixon: "Words for tobacco in North American Languages," American Anthropologist, Vol. 23, No. I, pp. 19-49.

south to Central Chile.¹ The most esteemed species of commerce, N. tabacum, appears to be eastern Andean in origin. In pre-historic times it was used as far north as Mexico and the West Indies. It had displaced the Mexican species N. rustica which was also an important domesticated species, used by all the American Indians of the eastern United States.²

Over most of western North America, reaching almost into Alaska, Setchell shows the distribution of a third native tobacco, N. attenuata. Endemic in this wide region and native to it, this species is a native resource that could have been utilized in very early times by the Uto-Aztekan.

The wide distribution of N. attenuata from California and Texas³ to southern Alaska is broken by a narrow belt of other species just north of the northernmost Uto-Aztekan. These species run east as far as the Mandan-Hidatsa and west to the Pacific, extending down the coast to southern California.⁴ The Californian Uto-Aztekan in the south differ from other Californians in using the Great Basin species, N. attenuata, which is reported both for the Cahuilla, who call it pavit isil (tobacco-cayote),⁵ and the Diegueños, who use the foreign stem op.⁶ Both

¹Setchell: "Aboriginal Tobaccos," Amer. Anth., Vol. 23, No. I, p. 401.

²Ibid. N. rustica was the first species to be planted by the Virginia Colony, but was soon superceded by the more esteemed N. tabacum from the West Indies. However, N. rustica is still the home-grown species of the peasants of central Europe, and furnished the "Tombac" for the water-pipes of Western Asia.

³Standley and Wooton: Flora of New Mexico, p. 568.

⁴Setchell: op. cit., map p. 414.

⁵D. P. Barrows: Cahuilla Ethnobotany, pp. 74-5.

⁶Leslie Spier: Havasupai Ethnobotany, pp. 74-5.
Significant non-Uto-Aztekan nomenclature is given, but

tribes cultivate tobacco near their houses, which is especially significant since neither tribe ordinarily practices agriculture. Thus, in tobacco species, as in much else, the Californian Uto-Aztekan are related to their linguistic relatives in the Great Basin and the Southwest, rather than their California neighbors.

In the southwest this species is reported for the Zuñi, who call it A'-na;¹ the Tewa Pueblos,² the Utes and Gosiutes, who call it pu'i-ba-u;³ while the same name, indicating the same species, is reported for the Northern Paiute, Paviotoso, pu'i-Ba pu.⁴

The Tobacco Complex and Archaeological Perspective

The Tubular Pipe: A "proto-Uto-Aztekan" Trait

Knowledge of the tobacco complex among the Shoshoneans is meager, as is so much else of this simple culture that was mostly gone before trained ethnographers reached the region.

not interpreted: Havasupi u'va; Shasta op; Takelma o^up; and for other species the same name is taken over; Crow op (N. multivalis); Hidatsa o^upe.

This nomenclature extending from the Pacific coast and following the species of tobacco which intersects the wide distribution of N. attenuata just north of the Uto-Aztekan, clearly indicates the diffusion of tobacco from the Sierra into the Plains as far as the Hidatsa and Crow. Specialists of the Plains should follow it further since nomenclatures are one of the surest leads of plant migrations as of other cultural migrations.

¹Stevenson: Zuñi Ethnobotany, p. 95.

²Robbins-Harrington, Tewa, pp. 103-5, also Gosiute Ethnobotany, p. 67.

³R. V. Chamberlain: Ute Plant Names, p. 30.

⁴R. H. Lowie: Notes on Shoshonean Ethnography, p. 215.

Lowie records for the Northern Paiute (Paviotoso) a straight tubular stone pipe used by the medicine men and passed to the right in ceremonies.¹ The stone tubular pipe is called tabiza by the North Paiutes² and is given considerable time perspective in this region by the finding of short tubular pipes³ in Basket-Maker I Lovelock Cave, one with a long mouthpiece attached.⁴

Considerable evidence indicates that the tubular pipe is "proto-Uto-Aztekan." Soapstone pipes, suggesting California, are reported from the Moapa Paiutes of southern Nevada;⁵ while among the Utes of Colorado tubular stone pipes of California affinities are reported.⁶ For California, knowledge of the tobacco complex is much more adequate. The tubular pipe in wood, often with a long mouthpiece, is found characteristic of the northern Californians.⁷ In southern California, the cultural affiliations are again seen toward the Great Basin and the Southwest, in stone and pottery tubular pipes. Among the Uto-Aztekan Californians, the Luiseno use a tubular pottery pipe called hukapish. It is smoked chiefly when lying down in the evening, which is the favorite time for smoking among the California Indians.⁸ Were knowledge more complete, this might prove a general custom, since among the Tarahumara tobacco is smoked, prefer-

¹Lowie: op. cit., p. 215.

²Loud-Harrington: Lovelock Cave, p. 148.

³Ibid., p. 65.

⁴Ibid., Pl. 52.

⁵Lowie: op. cit., p. 215.

⁶Wheeler: U. S. Geological Survey West of the 100 Meridian, p. 25.

⁷A. L. Kroeber: Handbook of California Indians, Pl. 30.

⁸Ibid., p. 653.

ably just before sleeping to guard the sleeper from evil. Among the southern Californian Diegueños, these tubular pipes are 6 to 8 inches long, called mukwin, and are used by the shamans in cures, by placing them against the patient's body and sucking; although sucking direct with the lips is also reported.¹ An invariable shaman's use of the pipe seems to have been blowing tobacco smoke, a pattern of very wide distribution in both North and South America.

In southern California a considerable archaeological depth to the material side of the tobacco complex is found in the tubular stone pipe in the Chumash and Uto-Aztekan archaeological sites in the Channel Islands. Short pipes in steatite² resemble the stone pipe with a mouthpiece from Lovelock Cave.³ From the Channel Islands is reported the typical short "cloud-blowers" of the classical Basket-Maker type. One specimen of Basket-Maker pipe was found in Utah with a mouthpiece of hollow bird bone attached,⁴ which is a California pattern. The longer tubular pipes⁵ are more common in the Californian islands. These are not lacking the Basket-Maker II horizon, being especially prevalent in Hough's report of work on the upper Gila,⁶ but also found in the classical Kane County, Utah, site.⁷ From the Big

¹A. L. Kroeber: op. cit., pp. 718, 723.

²Heye: Certain Artifacts from San Miguel Island, pp. 60-1, Pl. XXVIII.

³Loud-Harrington: Lovelock Cave, Pl. 65, c, p, q.

⁴Kidder and Guernsey: 1919, pp. 187-88, fig. 94.

⁵Wheeler: U. S. Geological Surveys West of the 100th Meridian, Pl. VII, VIII, IX.

⁶Hough: 1914, pp. 111-14.

⁷Nusbaum: 1922, pp. 132-37, Fig. 63.

Bend country of Texas, Coffin reports fragments of "cloud-blowers" made of limestone, from Brewster County;¹ while at the eastern limit of the area, the Bluff Dwellers of the Ozarks used tubular pipes, one with zig-zag decorations being reported.² Elbow pipes are rare in the Southwest but appear as early as Pueblo I.

East of the Ozarks the tubular pipe occurs sporadically in widely separated sites, but nowhere appears as the typical form. It has been found in mound and village sites in Ohio.³ There are a few specimens in the Peabody Museum from Andover, Massachusetts, and from New Jersey.⁴ From Johnson County, Illinois, tubular pipes in greenish brown steatite were found.⁵

In the ethnographic Plains, tubular pipes for ceremonial use, in itself suggesting antiquity, were used by the Cheyenne, Arapaho, and Crow.⁶ In view of the diffusion of tobacco carrying with it variations of the word op⁷ from California and the Sierra to the Hidatsa and Crow, it is not surprising that the tubular pipe of similar provenience survives among these Plains tribes.

That the tubular pipe does not have a wide eastern distribution is the most significant feature. The reason is probably

¹Coffin: 1932, p. 24.

²Harrington: The Ozark Bluff Dwellers, p. 13.

³Mills: Certain Mound and Village Sites in Ohio, Vol. III, p. 98, illus. p. 101.
Mills: Exploration of Tremper Mound, Vol. II, pp. 202-4.

⁴Wheeler: op. cit., p. 24.

⁵Ralph Linton: Use of Tobacco Among the North American Indians, p. 13.

⁶Ibid., pp. 12-13.

⁷See Footnote 6, p. 75.

that the principal eastern tobacco was the better Mexican N. rustica, and the plant may have brought with it the elbow pipe which is commonest in Mexico. The Mexican pattern later may have specialized into the types of elbow pipe characteristic of the elaborate tobacco complex of eastern United States. The problem of the diffusion of the tobacco complex into the United States should be as fertile as the study of the maize-metate complex; but this is clearly outside the scope of this paper.

From the early Pueblo phases the tubular "cloud-blower" is found in the Chaco and the Kayenta¹ and in the Piedras district of Colorado.² It is significant in the knowledge of other trade relationships between the Southwest and California, that in Piedras Roberts reports a steatite tubular pipe "which unquestionably came from California."³ The tubular pipe is also reported in eastern Arizona, east of the Puerco.⁴

The tubular pipe is not unknown from Mexico, though rare; the Aztec codices give a representation of the figure of what is apparently a priest blowing out the smoke in a manner reminiscent of the Hopi use of the "cloud-blower."⁵ This primitive tubular pipe received considerable elaboration at the hands of the Aztecs, as is proved in the historical accounts of the Spanish conquerors.⁶ In view of distributional and archaeological knowl-

¹Kidder and Guernsey: 1919, p. 144, Fig. 63.

²Roberts: Early Pueblo Ruins in the Piedras District, p. 153.

³Ibid.

⁴Roberts: 1931 BAE Bull. No. 100, p. 160, Pl. 40.

⁵McGuire: "Pipes and Smoking Customs of the American Aborigines," Ann. Rep. U. S. Nat'l. Museum, 1887, p. 371.

⁶J. A. Mason: Use of Tobacco in Mexico and South America, p. 677. Hieroglyph of tubular pipe in use from Codex Toano.

edge, the presence in the Aztec codices of the crude tubular "cloud-blower" in priestly use suggests a "proto-Uto-Aztekan" pattern remotely connecting with the use of the cloud-blower in the elaborate symbolism of the Hopi, and the simplistic shamanistic use of tobacco with pottery and stone tubular pipes in the Great Basin and southern California.

The Hopi, who ritually keep several ancient traits like coiled basketry trays, preserve the "cloud-blower" tubular pipe. This is ceremoniously used by the most important priest to offer smoke to the six points as a symbol of clouds in prayers for rain, as an essential part of their highly symbolic religion;¹ while similar conservatism is seen among the Tewa peoples.²

Corn husk cigarettes and the reed censer

At Zuñi occurs the first evidence of foreign elements in the conservative ceremonial tobacco complex. Here part of the elaborate rain symbolism in ritual is expressed with cigarettes of corn-husk,³ which has the double symbolism of both rain and corn. Cigarettes of corn husks are typically Mexican, even today; and are inconceivable before the diffusion of corn from the south. How one trait like corn can carry another like husk-cigarettes has been seen in the recent spread of the peyote cult among the North American Indians. Peyote carried the corn husk cigarette to many northern tribes in one decade.⁴

¹Hough: 1914, p. 111 (quotes Fewkes).

²Robbins-Harrington: Tewa Ethnobotany, pp. 103-5.

³Mrs. Stephenson: Ethnobotany of the Zuñi Indians, p. 95.

⁴Ralph Linton: Use of Tobacco Among the North American Indians, p. 9.

The cigarette phase of the tobacco complex in the Southwest carried another specifically Mexican element, the reed ceremonial cigarette or censer. These are among the most frequent offerings found in the sacred offering caves in the southern part of the Southwest, as well as along the Gila. They also appear to have penetrated north in the archaeological Pueblo horizon, being found in great numbers at Aztec ruin in the San Juan.¹ The censer is still used in Hopi.²

In Tulerosa Cave, a number of them had been burned as well as pierced through the septum of the reed, apparently for the purpose of smoking, as was the custom in ancient Mexico. The contents of the tubes burn with a pleasant odor, and there is no question but that they are symbolic offerings of incense.³

Datura--Jimson Weed

Another genus of plants of general ceremonial importance is the Datura, the poisonous Jimson weed, which properly prepared is productive of hallucinations. More violent in its action than tobacco, greater ritual or spiritual power was attached to Datura by the American tribes. But since it is a poison, it did not attract the early Caucasian interest as did tobacco; and much less is known of its ceremonial importance. Even so, Safford says of it:⁴ "In early accounts of the aborigines of America,

¹Earl Morris: The Aztec Ruin, p. 57.

²Hough: 1914, pp. 108-11.

³Hough: Incense and Censers.

⁴W. E. Safford: Narcotic Plants and Stimulants of Ancient Americans.

both north and south of the equator, we find many references to the use of daturas as narcotics." He mentions the Quechuas of Peru; the Omagua of the Rio Marañon for the southern Continent; as well as the Huaca-cachu of Peru, who made from it a very powerful intoxicant tonga which gives hallucinations interpreted as communications with the spirits of the ancestors. Throughout the literature on western North America, occur numerous references to Datura which will be examined in detail. Such a wide distribution even in this generally similar context, precludes tracing specific historical relationships. And as the author's experience with the Tarahumara indicated, a more probable explanation would attribute much of this lore to native experimentation with local plants leading to native uses for magico-religious purposes.

Among the ancient Aztecs, according to Padre Serna, tobacco, peyote, and Datura were ascribed divine powers with which magic was practiced. Like peyote, Datura was thought to give second sight and prophecy, by means of which could be discovered the identity of a thief, the outcome of a war, etc. According to Sahagun the seeds were called ololihqui, while the plant was called the "green snake weed." The seeds are especially poisonous and Sahagun reports that they "were administered in potions to cause harm to those who are objects of hatred. Magicians administer them in food or drink."¹

There is no evidence of the diffusion of this complex among the southern Uto-Aztekan. The Huichols emphasize peyote. The Tarahumaras use Datura for its strong magic in races, etc., but mostly they fear it, and call a peyote shaman to eradicate

¹Sahagun: Historia de Mexico, Vol. III, p. 241. Ed. of Bustamente, Mexico, 1830.

it from their dwelling caves. It is taboo for the ordinary Tarahumara to touch it. At Zuñi, Datura is important, being conceived of like the Aztecs as giving power of second sight. It is also used as an anaesthetic in operations.¹ The Northern Paiutes use it for the preparation of a strongly intoxicating drink.² The westernmost Uto-Aztekan, the Gabrieliño of the south Californian Coast, seem to have elaborated the ceremonial treatment of Datura into the most specialized form of the "Jimson-weed" cult in connection with the boy's initiation ceremony.³ This cult has a general south Californian distribution, extending into the lower Colorado River tribes. While Datura, like tobacco, is an important element in the basic Uto-Aztekan cultural sub-stratum, the evidence does not appear to the author to justify any attempt to trace specific historical relationships, especially since Datura is found with a similar ceremonial context in South America.

Feathered Ceremonial Artifacts

Two of the important ceremonial artifacts of Lovelock Cave are: a beautiful composite feather plume,⁴ and bunches of feathers tied with a cord.⁵ The latter are genetically comparable to similar bunches of feathers tied with a string found in

¹Mrs. Stevenson: Ethnobotany of the Zuñi Indians.

²Edward Palmer: "Plants Used by the Indians of the United States," American Naturalist, Vol. XXII, p. 878.

³A. L. Kroeber: Handbook of the Indians of California. Index.

⁴Loud-Harrington: Lovelock Cave, Pl. 20.

⁵Ibid., P. 148.

the Basket-Maker II White Dog Cave,¹ in the Kayenta, as well as in the Bluff Dweller culture of Arkansas.² From the latter site, fans made of feathers strung together with fiber cord offer a general similarity to the composite plume from Lovelock Cave.

Feathers have a world-wide context with ceremony and shaman curing. Struck with the importance of feather plumes among the Huichol shaman, Lumholtz expresses the concept well:³

The movement of birds, especially of those which soar the highest is incomprehensible to the Indians, and such birds are thought to hear and see everything and to possess mystic powers which are inherent in their wing and tail feathers. Hence plumes of the eagle and hawk are coveted by all American Indian tribes....

The so-called shaman's plumes enable the shaman to see and hear everything both below and above the earth; and with their help, he performs his magic feats, such as curing the sick, transforming the dead, calling down the sun....

The Tarahumaras do not use feathers in ceremonies or curing, except on the hats in the Holy Week festivities. But feather "fetishes" are described for the Pima,⁴ and the shamans require them for curing.⁵ The use of feathers by shamans among the Uto-Aztekan of southern California, does not appear in the literature; but generally throughout California shamans feathers are important and are often elaborated into wands, garments, ornaments, or headdresses. From the classical Basket-Maker site of White Dog Cave there is reported a feather headdress "not unlike the feather crowns used by the various California tribes in their ceremonies. The method of tying the feathers is dupli-

¹Kidder and Guernsey: 1919, p. 177, Pl. 81 a-f.

²Harrington: Ozark Bluff Dwellers, p. 9.

³Carl Lumholtz: Unknown Mexico, Vol. II, p. 7.

⁴Frank Russell; The Pima Indians, p. 115.

⁵Ibid., p. 260.

cated by the Wailaki and Shasta Indians."¹ So specific a similarity as this may have resulted from historic contact.

Shaman's plumes are not reported for the Californian Uto-Aztekan, but they are common among other Californians. The Achomawi use a bunch of feathers in treating the sick, as an oracle, and a source of the shaman's black magic;² while among the Maidu, objects called yompa are made by shaman of feathers and other things.³ In the modern Pueblos, the use of feather plumes in curing by the members of the medicine societies is common.⁴

Medicine Bags

Another class of Elementargedanken are fetishes; but the "medicine bags" which are so common in the eastern United States, tempt the historian to posit historical relationships. Far to the west among the Pomo in California these are found as animal or bird-skin containers for obsidian, colored pebbles, bones, dried parts of animals, and any unusual object. These are warmed by the fire and pointed at the patient in curing ceremonies.⁵ This is reminiscent of the Plains, a similarity that is even more specific among the Yokuts, where the shaman's medicine bags are hung up during the ceremonies, after which the

¹Kidder and Guernsey: 1921, p. 103, Pl. 40.

²A. L. Kroeber: Handbook of California Indians, p. 315.

³Ibid., p. 426.

⁴Leslie White: Medicine Societies of the Southwest.

⁵A. L. Kroeber: op. cit., p. 258.

performing shamans "fight" each other¹ with their medicine bags. To Kroeber this savors more of the Plains than California, with the exception of the Pomo parallel. The whole complex has a striking similarity to the Winnebago ritual.

The wide gap between California and the Plains-Winnebago occurrence of the medicine bag is partially filled and given a considerable antiquity by the finding of similar bags of animal skin with similar random and bizarre collections of contents, in the classical Basket-Maker phase of the Four Corners Region both in the Kayenta² and the Kane County, Utah, site.³ More than a generic similarity can be seen in the bird-skin medicine pouch which is reported from White Dog Cave, Kidder and Guernsey pointing out:⁴

A Pomo doctor's outfit in the Peabody Museum collection contains a number of bird's heads stuffed with grass, which reminds one of this specimen.

The possibility of historic association between the Pomo and Basket-Maker bird-skin medicine pouches is conceivable in view of many other Basket-Maker traits shared by both horizons as well as such specific traits as deer noose and net snare. (See p. 50ff.)

Historically, the Plains and Winnebago ceremonial medicine bag can hardly be connected with either the Basket-Maker or the California specimens. Still the ethnologist may be allowed to attempt to imbue the archaeological specimens with the meaning that they must once have had in functioning in a living culture.

¹A. L. Kroeber: op. cit., p. 507.

²Kidder and Guernsey: 1919, p. 30; 1921, p. 108.

³Nusbaum: 1922, p. 147.

⁴Kidder and Guernsey: 1919, p. 102.

Probably then as now, they gave the shaman the power to cure and to work miracles, a power that human societies both primitive and civilized demand to some degree of their priests and doctors. This is the raison d'être for Elementargedanken of this sort.

Games

Cup and ball game

The archaeological Basket-Maker horizon provides material remains of game paraphernalia that are significant in the light of the ethnographic distribution of games. From Lovelock Cave, "cup-and-ball" artifacts in tule are of specific Klamath structure.¹ This game is a variant of the ring and pin game, variants of which are distributed from Maine to California so no specific relationship can be posited for the Luiseno variety using acorn cups,² or the Havasupi³ and Mopapa use of the rabbit skull in this game,⁴ which suggests the Eskimo variety.⁵ The Pima, Zuni, and Tewa of Hano use a form of the game with one or more rings.

Another universal North American pastime was the guessing game. But one variety of the hand guessing game is reported by Culin for the western part of North America. Bone or elk teeth

¹Loud-Harrington: Lovelock Cave, p. 92, Pl. 44b-d.

²A. L. Kroeber: Handbook of the Indians of California, p. 847.

³L. Spier: Havasupi Ethnography, p. 346.

⁴Lowie: Notes, p. 257.

⁵Culin: Games, p. 548, Fig. 724.

were used as caches by the Utes,¹ the Comanche² and the North Paiutes,³ while short pieces of bone or wood are similarly used by the Uto-Aztekan of California,⁴ where all accounts prove that the game was as fascinating to the Indians as poker among ourselves.⁵

Dice games

From the classical Basket-Maker was found a gaming set of eight lenticular bone dice, with one surface scored, and three round dice with one side coated with pitch;⁶ while from Tulerosa Cave similar circular ones are reported "with one side covered with gray mud."⁷ Culin identifies both types as dice though he cannot find any precise modern analogues.⁸ The general forms are seen among the Shoshone in the northern Plains, which with the archaeological evidence suggest a Uto-Aztekan proto-type.

More specifically significant are six stick-dice from Cave I in the classical Basket-Maker of the Kayenta.⁹ Stick-dice games are so wide-spread as to be almost universal in North

¹Lowie: op. cit., pp. 257-8.

²Lowie: The Northern Shoshone, p. 195.

³Lowie: Notes, pp. 257-8.

⁴Culin: op. cit., pp. 323-24.

⁵A. L. Kroeber: op. cit., p. 848.

⁶Kidder and Guernsey: 1919, p. 189, Pl. 86 g.

⁷Hough: 1914, p. 128, Pl. 25.

⁸Culin: op. cit., p. 48, Fig. 7.

⁹Kidder and Guernsey: 1919, p. 186, Pl. 84 (24-30).

America; so it is safe to allow at least this antiquity for the game in the Four Corners Region. The game is played most commonly by bouncing the dice by throwing them against a stone, as seen among the Northern Shoshone;¹ while the Pima-Papago variant is throwing the dice from the upturned palm of a hand struck from below by a stone held in the other hand.² In the northern part of our area the Utes³ and the Mono⁴ characteristically used baskets to catch the dice.

Spier's analysis of basket-dice in the Southwest must be quoted en extenso:⁵

Basket-dice is a widely distributed game, and the Havasupi have no special form of it. It is generally a woman's game in this area, but played by both sexes among the Navajo, the Zuñi, and Mohave, although the first consider it especially a man's game. The number of dice varies, but not randomly: Havasupi, Maricopa, and Pima, four; Mohave four but only three are used in play; Zuñi, four or five; Paviotoso and Washo, twelve. These are all long wooden or bone dice. White Mountain Apache use thirteen or fourteen small chips, Navajo thirteen or seven....

In another form of the dice game in this area, the Zuñi use small chips, three lozenges and three squares, thrown from a board; and the Wind River Shoshone, three lozenges and three discs tossed in a basket.... The Wind River Shoshone and the White Mountain Apache strike the basket on the ground. The latter sometimes throw the dice into the basket.

The scoring is variable, but there are identities. All four faces up, count one for the Havasupi, Mohave, Maricopa, and Pima. All faces down count one for the first pair, two for the second pair of tribes. Any other throw does not score for any of them. It is clear that they recognize clearly that all of a kind is necessarily the most infrequent throw.

The universal distribution of this basket-dice game from the Northern Mono, south throughout the Southwest, makes it a

¹Lowie: The Northern Shoshone, p. 195.

²Russell: The Pima Indians, p. 175.

³Lowie: op. cit., p. 195.

⁴Culin: American Indian Games, p. 170.

⁵Leslie Spier: Havasupi Ethnography, p. 346.

plausible conjecture that the stick-dice found in the classical Basket-Maker phase of the Four Corners Region were used with the baskets that are so characteristic of this ancient culture. Thus basket-dice may have been a "proto-Uto-Aztekan" game.

In the Southwest and among the southern Uto-Aztekan the same type of stick-dice, thrown in the same way is used in the well-known Aztec game patolli--a game so similar to the East Indian game of parchesi that Tylor, who we think of as an evolutionist, suggested diffusion between the two regions.

The Patolli-Parchesi Problem

In 1878, in a classic review of the sources of his time, Tylor¹ posits diffusion to account for the striking similarity of the East Indian game of parchesi and the Aztec game of patolli. In both games the tally board is a cross-shaped series of squares, over which the counters are moved according to the throw of dice. Tylor quotes Father Joseph Ochs (S. J., 1754) to show the presence of patolli as far north as the Tarahumara-Pima. This study presents a most convincing case for the prehistoric diffusion, possibly by a wind-blown junk, of an isolated trait from the Old World to the New. His subsidiary interpretation of calendrical similarities is now known to be spurious.

Tylor's specific similarity, based on the local Aztec cruciform tally-board, merges into a wider and more general parchesi principle of moving men over a circuit with the jeopardy of being overtaken and killed by an opponent's man, or/and being

¹E. B. Tylor: "The Game of Patolli in Ancient Mexico and Its Probable Asiatic Origin." JAI, Vol. 8, pp. 116-31, 1878.

held near home until the exact or a certain number is cast with the dice. This game is played over a circuit generally of forty stones or holes, in the form of a square or circle, sometimes broken by "doors" or "rivers" (as an occasional additional vulnerability).

This game has a distribution practically limited to the southern Uto-Aztekan and the Pueblos. It is reported for the Aztec¹ and Tepejuane,² the term for Tarahumara game, quince, appears related to the Pima-Papago term Kin^skut³ which is the identical game in every detail of dice-counting, form of circuit, etc. The game is undoubtedly old in this region, since it is reported by the first Spanish priests in Northwest Mexico under the name patolli in 1645, a century before Tylor's citation, and at a date so early as to counterindicate a Mexican-Spanish dissemination of the game.⁴

Spier, who gives valuable discussion and analysis of the game,⁵ seems inclined to attribute the Southwest and southern Californian occurrence of the game to its having been carried by the Mexicans, especially in view of the quince nomenclature. This is very possible since fifteen, like the Sanscrit word parchesi,⁶ is the value for the highest throw of the dice. But this may not be a Spanish word at all. The Pima call the game kints⁷ and

¹E. B. Tylor: op. cit.

²Culin: op. cit., p. 153.

³Frank Russell: The Pima Indians, pp. 175-6.

⁴Fr. Padre Andres Perez de Ribas: Historia de los Triumpone, p. 14.

⁵Leslie Spier: Havasupi Ethnography, pp. 347-51.

⁶E. B. Tylor: op. cit., p. 119.

⁷Frank Russell: op. cit., p. 175.

the Papago word is kiⁿtskut,¹ which may well be the Tarahumara quince. The Pueblo nomenclature of the game is by no means consistent and the Keres name ka-wa-su-kots² suggests the Papago word. Finally, it is at least safe to conclude that the game was preHispanic in this general region, and related to the Aztec patolli.

Following Spier, the distribution of the game in the United States includes all the Southwest tribes. But outside the Southwest the game is reported only among the Northern Diegueño to the west and the Kiowa to the east.³ Culin's data on the Hopi are interesting. The Hopi played the game under the Aztec name toloque and in 1899 used sandstone slab boards with a tally-circuit in squares and circles so identical with modern parchesi boards that they must be modern imitations,⁴ especially since no archaeological evidence appears to prove their antiquity.

While all these patolli games use simple forms of stick-dice, thrown as in the ordinary dice game, still convincing seriation evidence indicative of local development of patolli from the simpler game does not appear. The northern Uto-Aztecs play basket-dice, the Shoshone⁵ bet a certain number of counters on equalling or bettering a certain number of points, which are won by success if not then equalled or bettered by the opponent. For the Utes, nearer the Southwest, are many pictures of basketry-

¹S. Culin: op. cit., p. 146.

²Ibid., pp. 121-22.

³Leslie Spier: op. cit., pp. 347-51.

⁴Culin: op. cit., pp. 161-62.

⁵R. H. Lowie: The North Shoshone, APAMNH, Vol. II, Pt. 2, 1909, p. 196.

dice but no accounts.

From such simple dice games as these, the Pueblos and southern Uto-Aztekan offer the much more elaborated game of patolli, based on the principle of moving a counter over a circuit of forty under the jeopardy of being returned home if met by an opponent. Since seriation evidence does not fill in the steps between the simple dice game and the more complicated patolli, we must agree with Kroeber¹ in the plausibility of Tylor's thesis of the diffusion of this game from the Old World.

Football Kicking Race

The football kicking race between teams presents a game distribution practically co-terminous with that of Uto-Aztekan languages, a fact which suggests the game to be "proto-Uto-Aztekan." The northernmost occurrence reported is from the Uto-Aztekan Mono-Bannock of Idaho,² southward among the Shoshone-Comanche where the game is called da-na-cö-tö'-ñn.³ There is considerable probability that this game has some antiquity in this region since such balls are found in Lovelock Cave.⁴

The game is not reported for the Utes. Its presence in California among the Uto-Aztekan Diegueño and Luiseño is another link of these people with their Shoshonean kinsmen of the Great Basin. In Southern California the game is also played by the

¹A. L. Kroeber: "Historical Reconstruction of Culture Growth and Organic Evolution," Amer. Anthropol. Vol. 33, No. 2, P.3.

²Culin: op. cit., pp. 665-67.

³Lowie: The Northern Shoshone, p. 198. The stem de-na cf. Tarahumara Da-ra (to run).

⁴Loud-Harrington: Lovelock Cave, Pl. 52.

nearby Costanoan and Kroeber says that it had penetrated into the interior among the Miwok and Maidu¹ from the Uto-Aztekan.

In the Colorado River region, the game is played by the Cocopa, Maricopa, and Mohave, who furnish a link between southern California and the Pima. In the Southwest proper it occurs among the Hopi, Keres, Tewa, and Zuñi, as well as the marginal Navajo.

Among the southern Uto-Aztekan it is important among the Pima-Papago, Opatá, and Zuaque (Sinaloa).² This football game gives the large Tarahumara tribe its name; and here is an important social institution, furnishing the only native form of intercommunity activity, having great social and ritual importance. Its southernmost reported occurrence is among the Tepejuane.³

Culin⁴ says that the object kicked is of three different kinds: a ball of wood (Opatá, Papago, Pima, Tarahumara, Zuaque, Cocopa, Mohave, Yuma); or a ball of stone (Pima, Mono, Tewa, and Maricopa); second, a single billet (Navajo) or two billets (Keres, Tewa, Zuñi); third, a ring or rings (the Tarahumara⁵ and Zuñi). The Hopi use two cubes of hair and Pinon gum.

This game, then, striking coterminous with the Uto-Aztekan languages, may be "proto-Uto-Aztekan," since the balls come from the Basket-Maker I site of Lovelock Cave, and both the wooden

¹A. L. Kroeber: Handbook of the Indians of California, p. 848.

²Culin: op. cit., pp. 665-67.

³Lumholtz: Unknown Mexico, pp. 424-25.

⁴Culin: op. cit., p. 669.

⁵Two interlocking rings are used in the Tarahumara woman's race, each of which are thrown with a forked stick, Culin, Op. cit., p. 677, Fig. 897.

ball and the billet were found in the classical Basket-Maker of the Kayenta.¹ And from the same locality is a cedar ring, identified as used for carrying burdens on the head,² which might have been used in the ring form for the football race.

Evidences of Prehistoric Trade Between
Southern California and the
Basket-Makers

Evidences of Trade from California to the Southwest

Two very frequent and consistent elements of personal decoration are found of wide distribution in the archaeological horizon prove ancient cultural contacts between the Great Basin and southern California. These are the olivella shell (Olivella biplacata) and the abalone shell (Haliotis sp.), marine species from southern Californian waters. Historically these shells are a very important early Uto-Aztekan link throughout the ethnographic area as far south as the Tarahumara and include the modern pueblos and extend back unbroken to the earliest Basket-Maker sites.

Olivella shell.-- Used whole or broken into a disc form as a bead or as a decorative element in the necklace, this shell is important as a characteristic Basket-Maker decoration. In

¹Kidder and Guernsey: 1919, p. 186, Pl. 84 (22-23); also 1921, Pl. 36 b.

²Ibid., p. 175 Pl. 80d.

Lovelock Cave it is found in a complex tie¹ as a necklace, and as a decoration for a leather moccasin.² Both the flat and whole bead forms occur in these classical Basket-Maker sites of the Four Corners Region: Kane County,³ and the Kayenta.⁴ These carry on to the early phases of Pueblo culture,⁵ and have persisted until modern times as among the Zuñi.⁶

From the marginal Basket-Maker sites olivella shells are reported from Tulerosa Cave⁷ in the upper Gila and from the vicinity of El Paso.⁸

A high esteem for this shell as a decoration has survived among the Northern Paiutes from the region of Lovelock Cave where they are called potE.⁹ The fragmentary knowledge of the Southern Utes yields nothing; but as the California coast is approached, the olivella shell is more common and plays a varying role in the shell money economy of California aboriginal culture.

Only among the desert-dwelling Cahuilla, and the Luiseño was the olivella shell type of thin curving discs used for money.¹⁰

¹Loud-Harrington: Lovelock Cave, p. 105.

²Ibid., p. 47, Pl. 21.

³Nusbaum: 1922, p. 82.

⁴Kidder and Guernsey: 1919, p. 161; 1922, p. 47.

⁵Ibid., p. 101.

⁶A. L. Kroeber: Handbook of the Indians of California, p. 631.

⁷Hough: 1914, p. 37. Described as "small Southern Californian clam-shell."

⁸Roberts: 1929, p. 13.

⁹Loud-Harrington: Lovelock Cave, p. 105.

¹⁰A. L. Kroeber: op. cit., p. 705.

Among the Northern Californians, as the Yurok, other shells were used for money and a clear distinction made against the *olivella* as purely a decorative shell;¹ except among the Maidu.²

As might be expected, the highest frequency of these shells is found in the Chumash-Uto-Aztekan archaeology of the islands of southern California. It is found to the exclusion of other forms like the *dentalium* (or northern derivation) and *Saxidomus aratus* or *gracilis*, which are now commonly used for money. However the clam *Tivela crassarelloides*, which is used for money in southern California,³ is found in San Miguel archaeology.⁴ But of the *olivella* shell in these sites, Heye says:⁵

The beads most common on San Miguel are those of the *Oliva* or *Olivella biplicata*, in a single grave more than six thousand shells having been found....

These beads are round, oval, and even rectangular, the latter having inlaying....

Oliva and *olivella* shells are not always worked into discs, but are also used for beads by grinding off the points and sometimes both ends to a greater or less degree. (Fig. 33 b).

The first Spanish voyagers found the islanders supplying shell money to the Indians of the mainland,⁶ and the high frequency of olive shell may indicate its former importance as money in southern California. Thus is built up a bit of the history of the *olivella* shell, so important throughout the archaeological horizon, and a glimpse is afforded of a shell

¹A. L. Kroeber: op. cit., p. 25.

²Ibid., p. 421.

³Ibid., p. 825.

⁴Heye: Artifacts from San Miguel Island, pp. 149-51, Pl. 31.

⁵Ibid., pp. 154-55.

⁶Ibid., p. 152.

money economy in which Olivella shells are now unimportant except among the Luiseno-Cahuilla. The once important complex thins out in the Great Basin to a widely distributed trade ornament, extending throughout the wider archaeological horizon.

Abalone shell.-- The other shell conclusive of trade between southern California and the ancient Basket-Makers is the abalone (Haliotis sp.). This is found as a trait through both southern California and Basket-Maker archaeology. From the Chumash and Uto-Aztekan Channel Island sites, Wheeler¹ and Heye² show dozens of types of decorative and utilitarian traits, with countless ornaments, some of which are inlaid with olivella. Among the dozens of types and techniques appearing in the elaborate abalone complex of southern California archaeology, two forms are very significant for this study as historic prototypes of ornaments still used in the Great Basin Pueblos.

There is a round pendant form with a single perforation near the margin for suspension³ or a similar round type with two holes near the center;⁴ while the second type is a triangular pendant form with one or more perforations.⁵ These can safely be said to be the prototypes of the very characteristic forms common in the entire Basket-Maker horizon because they are all

¹Wheeler: U. S. Geological Surveys West of the 100th Meridian. Vol. 7. Still a valuable source on the archaeology of the Channel Islands especially on account of its excellent plates. For types mentioned in text see Pl. XII.

²Heye: op. cit.

³Ibid., Pl. LXXXI.

⁴Ibid., Pl. LXXXVI.

⁵Ibid., Pl. LXXXVIII.

of this marine shell which comes only from southern Californian waters.

The abalone shell is esteemed as an ornament by many of the Californian tribes as the Yurok,¹ Wintun,² and the southern Maidu;³ and its place in Californian culture is thus summarized by Kroeber:⁴

Haliotis was much used in necklaces, ear ornaments, and the like, and among tribes remote from the sea commanded a considerable price, but was nowhere standardized into currency.

In far-off Nevada, Lovelock Cave yielded the round type of abalone ornament: one large with two perforations, and a small disc with only one.⁵ The pattern is still preserved by the modern Paiutes who use the large two-hole form by attaching it to the hair by a string passed through the holes, and tied to a braid of the hair.⁶ The smaller form with one perforation is used as an ear disc, as in California, and is called naaka-gog'a by the modern Paiutes. Among the Uto-Aztekan Koso-Panamint there is a reference to the use of abalone.

In the classical Basket-Maker phase, Kidder and Guernsey report the round form,⁷ two of which have double perforations with an incised decoration in parallel lines⁸ similar to the

¹A. L. Kroeber: op. cit., p. 25.

²Ibid., p. 421.

³Ibid.

⁴Ibid., p. 826.

⁵Loud-Harrington: Lovelock Cave, pp. 105-6, Pl. 53, c-d.

⁶Ibid.

⁷Kidder and Guernsey: 1919, p. 163.

⁸Ibid., 1921, p. 49.

California archaeological design element in clam shell.¹ The triangle pattern in abalone is characteristic of the archaeological Basket-Maker horizon, and occurs in the Kayenta made from the thickened end of the Haliotis,² and is seen in Basket-Maker III with a double perforation in the base of the triangle.³

But greater ceremonial significance is seen in the small round pattern in abalone, found attached to a ceremonial object;⁴ giving some indication of the esteem in which were held these primitive valuables from far away.

Not only is the California pendant form constant in the classical Basket-Maker phases but in this region furnished the pattern for the triangular turquoise ear-pendant, now so characteristic of the modern Pueblos. This new and more highly esteemed jewel appears first in Post Basket-Maker of the Four Corners Region.⁵

In the marginal Basket-Maker horizon, abalone shell ornaments of both types are figured from the vicinity of El Paso,⁶ where the material was also used as an inlay for wooden combs. From here it is not too far a step to the modern characteristic appearance of this shell in the triangular ear pendants of the Tarahumaras, which are found in the prehistoric archaeological levels as well. It is, of course, quite probable that the type on southern Chihuahua is derivative of the Yaqui-

¹Heye: Certain Artifacts from San Miguel Island, p. 148, Pl. CXV.

²Kidder and Guernsey: 1921, p. 49.

³S. J. Guernsey: 1931, p. 68.

⁴Kidder and Guernsey: 1921, p. 49.

⁵Roberts: Shakik'schchee Village, p. 132.

⁶Roberts: 1929, p. 13.

Mayo groups, bordering the Gulf of California, just across the Sierra from the Tarahumara.

From Martin Ruin on the upper Gila, Hough reports a cylinder of fine grade purplish stone, having five grooved cuts around it,¹ which is compared to a similar type from Potts Valley, Santa Catalina, California.² It is similar to artifacts from San Miguel Island.³ In view of the other trade relationships between the two areas, the author accepts the relationship that Hough suggests, as of trade between southern California and the Gila.

In California, Kroeber discusses stone cylinders, apparently of this type, that were most highly prized as valuables and were called by the Pomo their "gold money" in contrast to their shell "silver money."⁴ These north Californian forms were of magnesite and traveled as far as the Yaki and the Miwok.⁵

Evidences of trade from Southwest to California.

Nor is the archaeological evidence completely lacking as to the goods and services from the Southwest given in exchange. As before mentioned, in an archaeological find in the San Joaquin Valley⁶ were found twined bags

"Bearing an especial likeness to those of the Basket-

¹Hough: 1914, p. 29.

²Wheeler: 1879, p. 211.

³Heye: op. cit., p. 61, Pl. XXX.

⁴A. L. Kroeber: op. cit., p. 249.

⁵Ibid., p. 825.

⁶Ibid., p. 935.

Makers of Grand Gulch, as well as an unornamented cotton blanket unquestionably made among one of the settled tribes of New Mexico or Arizona. It is, however, suggestive that the last wearer of the blanket was certainly not following the style customary among the people who originally wore it. (The purchaser) had roughly cut into it, two ragged holes for his arms so that he could put it around himself as a coat.

Nor is concrete evidence lacking of the services that have come from the Southwest to southern California along the prehistoric trade-routes of sea-shell. Only in southern California is found a simplified form of the characteristic Pueblo sandpainting, or ground altar. This ceremonial element is so striking and unique for these two areas that the author does not hesitate to follow Kroeber in positing an old historical connection between them.¹ These altars are found in California only among the Uto-Aztekan. But they are too sophisticated to be thought of as a "proto-Uto-Aztekan" trait that had disappeared in the Great Basin.

Still considerable antiquity is obvious since the ground-painting altar has been thoroughly integrated into the characteristic ceremonial culture of southern California, and in both function and structure has lost much of its Southwestern context. Among the Luiseño the ground altar is now an integral part of the more ancient initiation rites for both boys and girls, as well as the death rites for initiates.² Among the Juaneño, the altar functions in the Chungichnich cult, being placed before the representation of the god; and it is also used in the initiation of boys of high rank who do not drink the Jimson weed.³ Structurally the symbolism, subject-matter, and style are thorough-

¹A. L. Kroeber: op. cit., p. 661.

²Ibid., p. 662.

³Ibid., p. 639.

ly local both among the Luiseno and the adjacent non-Uto-Aztekan Diegueño, for whom the best accounts are available. Quoting Kroeber,¹

In all cases it is clear that the essential subject of the depiction is the world. The Luiseno, however, are chiefly concerned with revealing its subtler manifestations--the mysterious encircling Milky Way, the all-encompassing night or sky--or its still more spiritual phases as expressed in a symbolism of human personality; the arms, the blood, our root or origin, the spirit. Within this frame are indicated--depicted would be an exaggerated word--the punishers sent by the invisible Chungichnich: the raven, rattle-snake, spider, bear, wolf, mountain-lion, and the cryptic Apmikat and "breaker." In the very center is the hole symbolic of death and of the burial of human ashes....the above of the dead; or the navel of the Universe.

To the Diegueño this abstruseness and mystic craving are foreign. They paint the world indeed; but it is the visible universe. The enclosing circle is merely the horizon or the edge of the world. The figures within it are a downright map of the mundane surface and the celestial sphere.... Having mapped his world, the Diegueño proceeds to fill it with living beings. These are not mere heaps of pigment to which an old man can point while naming dangerous animals in his sermon on the punishment of disobedience, but actual representations.... The spider can be distinguished from the snake, the snake from the wolf.

While reported from the Fernando, the Cupeño, and Gabrielino,² little information of the sand-painting ground altar survived the disintegration of Californian aboriginal culture. Its presence among the Cahuilla and the non-Uto-Aztekan Chumash is in doubt.³

In conclusion, the isolated presence of the sand-painting altar at the source of the prehistoric trade in shells, which runs throughout Pueblo history, gives incisive distributional evidence that priests must have travelled along the prehistoric trade routes offering their highly technical and professional services. These well may have been much in demand by

¹A. L. Kroeber: op. cit., p. 662.

²Ibid., p. 626.

³Ibid., P. 661.

simpler folk without benefit of such sophisticated clergy.

The actual situation among the Huichols shows how important a role in cultural diffusion is played by the sacrosanct priest or shaman. He may travel far among neighboring tribes, guarded by the sacredness of his elaborate ritual, highly esteemed by tribes with no such ceremonial expression. The Huichol call and think of themselves as priests, and a surprisingly large part of the population actually are priests. Their disproportionate number is largely supported by an invisible balance of trade resulting from their support by Cora, Tepecano and Aztec clients and even their more ignorant Mexican vecinos.¹

¹Carl Lumholtz: Unknown Mexico, Vol. II, p. 21.

Summary and Conclusions

Knowledge of the earliest Uto-Aztekan culture comes from the archaeological material of the northernmost region of Uto-Aztekan distribution. The hypothesis that this archaeological material is in part the remains of Uto-Aztekan people rests on its high correspondence with the culture preserved by the Shoshoneans of the region.

Lovelock Cave in northern Nevada gives archaeological evidence of a considerable antiquity of a generalized Basket-Maker culture still functioning among the "Digger" Shoshonean peoples in the desert environment of the Great Basin, the northern edge of the Southwest, and southern California.

The ancient culture also appears to have been based on a food-gathering subsistence enabled by concentrated utilization of almost every food resource yielded by a meager and stingy nature. Wild seeds bulked large in food resource. Until recently seeds were still characteristically gathered by beating the bushes with a seed-beater, and by collecting the seeds in a basketry tray. Transported by the women in a carrying-basket on a tumpline to a crude brush shelter, the seeds were broken on a mortar and cooked by parching with live coals in a coiled basketry tray. The introduction from Mexico of the corn complex affected most of this area only by the adoption of the grinding-slab metate for mulling seeds.

In ancient times, as in the modern culture, roots were of course esteemed, and the digging-stick was universally used for uprooting them. The crude digging-stick of the archeological Basket-Maker I furnished the pattern for the principal tool of those tribes which took over the cultivation of corn. In most

of the area, the digging-stick remained until historic times in its original function for gathering roots. Probably throughout the area since Basket-Maker times, the earth oven has comprised the cooking technique both for roots and fibrous plants necessitating prolonged cooking. By a rather complex technological use of the earth oven coarse plants like Agave and Yucca were made available as a sweet food.

There is abundant archaeological evidence that coiled basketry provided the principal utensils used in the collection, transportation, and cooking of food. The antiquity of coiled basketry in the Basket-Maker horizon is significant in view of its modern distribution as far north as the Athabaskans and Eskimo. This technology of food gathering and preparation still functions among the "Digger" Shoshoneans.

In the archaeological horizon are found: bowls; coiled trays for parching and for other purposes; carrying baskets for carrying and storing food, and those with a lining of pitch, for water. In desert country the storage of water is an important function to intrust to coiled basketry since loss might mean serious inconvenience or even death.

This older picture of technological simplicity in coiled basketry technique is complicated by the addition of twining. Both the ethnographic and archaeological horizons yield a correlation in the frequency of twining against coiling toward the north, which argues for a diffusion of twining from the Northwest Coast, where it is characteristic. In the Great Basin, the twining technique was given a specific Shoshonean elaboration into twilled twining, seen only in "diagonal twined" basketry. This involves a very different technological principle. Nowhere in the Great Basin did this technique completely displace the

older archaeological method of coiling.

The fauna was as important to the ancient Basket-Makers for food as to their modern descendants. The large mammals appear to have furnished only a casual source of subsistence, and probably insects and reptiles provided a large proportion of animal food. From the larger game tanned buckskin, horn, and bone were used for implements. The faunal resource par excellence of this region was the ever-present and common jack rabbit. The meat was cooked by hot-stone boiling or by roasting over the fire. Rabbit skin furnished a soft and warm blanket, a trait whose distribution is practically identical with coiled basketry, and which has given archaeological antiquity throughout the Basket-Maker horizon. The importance of the rabbit is evidenced among the Shoshoneans by communal hunts with an authorized leader. This is given archaeological indication by the widespread occurrence of rabbit nets in the archaeological horizon. The curved rabbit stick of archaeological and ethnographic occurrence served as a weapon of the individual hunter.

The ancient weapon for large game, and possibly for war, was the paleolithic dart-thrower and a characteristic fore-shafted dart, which furnished the pattern for the arrow upon the introduction of the bow. The Uto-Aztekan retention of the dart pattern was so strong that the southernmost Aztecs and the westernmost Uto-Aztekan Channel Islanders in California retained the atlatl until historic times; while at the extreme North of the Uto-Aztekan area, the Paiutes recently provided a wooden arrow-shaft with a functionless fore-shaft. The modern fore-shafted arrow seems clearly to be a development from the "proto-Uto-Aztekan" dart. In Lovelock Cave this dart type of arrow was given an extraordinarily long fore-shaft, apparently to carry

symbolic "blood-grooves" of general west American distribution.

Trapping augmented the hunter's catch, and a perfect rabbit net snare from Utah gives archaeological antiquity for such technological control of the natural environment. There is some archaeological evidence of the antiquity for the figure 4 string and stick trap of modern distribution from the Tarahumaras to the Northern Paiutes, suggesting a "proto-Uto-Aztekan" trait. Even more sure is the archaeological evidence of deer-noose snares with a net, seen in California and among the Huichols.

A diagnostic clothing trait for this archaeological horizon is the string-fiber apron skirt for women, recently characteristic of California. It was probably distributed throughout the Great Basin, although the fragmentary data reveals it only for the Northern Paiutes. Rabbit-fur blankets and clothing are ubiquitous in both the Basket-Maker and Shoshonean phases of the culture; rabbit-fur rope, made by several techniques of twisting with or without a basic cord, are characteristically twined on a horizontal loom arrangement. This may be the prototype for the true loom with the invention of the idea of setting up the warp fiber as two separate shed sets. A third diagnostic trait of clothing is seen in sandals involving the technological principle of warp fibers formed to fit the foot, about which the weft fibers were woven or twined. This trait, also, links the archaeological Basket-Maker, the Shoshoneans and the Uto-Aztekan Californians. Bone or wood hair pins as head ornaments provide a less general link connecting the southern Utes and the Basket-Makers of the classical phase, and some of the marginal sites. Hair nets in Basket-Maker I, and Chihuahua material, suggest this as a "proto-Uto-Aztekan" trait still seen in Cali-

fornia and in elaborated form among the Huichols.

Archaeological evidence as to the "proto-Uto-Aztekan" house is lacking. The light structures of the modern Shoshoneans suggest that an impermanent dwelling, if any, was used. Ancient cave dwelling is suggested by the modern use of caves for this purpose.¹

Evidence of structures for storage is so common throughout the Basket-Maker horizon in the form of "pot-hole" excavations that it may be considered a "proto-Uto-Aztekan" trait as well. These storage cists were so often given secondary use for burial in a flexed position as to carry a similar suggestion of early Uto-Aztekan.

Household implements like bone-awls, stone mauls, etc. are probably of "proto-Uto-Aztekan" as of more general affiliations. "Proto-Uto-Aztekan" fire-making must have utilized the drill-hearth technique. Flexible twined bags connect the entire Basket-Maker horizon with the modern Shoshonean Californians suggesting a "proto-Uto-Aztekan" trait of more general distribution.

Some archaeological perspective can be given to ceremonial traits of Shoshonean culture, which are suggestive of Uto-Aztekan prototypes. In ancient, as well as recent times, tobacco was probably regarded as a sacred plant of strong spirit, especially useful to the shamans by whom, until recently, it was smoked in the tubular pipes. Tubular pipes appear as "proto-Uto-Aztekan" traits since they are found throughout the archaeological horizon and recorded in the Aztec codices. Datura, another plant

¹It has attracted much attention that the Aztec legends recall emergence from caves before their migration toward the south. However no specific historical connections can be posited on such slender evidence.

with even a stronger spirit or power, has attracted less attention than tobacco, but may have been no less commonly or generally esteemed. This plant is of wide ceremonial distribution in America, and was apparently universally given shamanistic power among the Uto-Aztekan, from the Aztecs to the Paiutes, while in southern California a local but well defined religious cult is specifically Uto-Aztekan.

Another source of shamanistic or ceremonial power appears in feather fans, wands, or plumes prominent in California and the Southwest. These have archaeological antiquity in the Basket-Maker horizon; though the connection may be no more than that of elementargedanken. The medicine bag of bird or prairie-dog skin filled with curious odds and ends is given a more specific indication of antiquity by the Basket-Maker specimens. It is tempting to relate these ancient specimens with the similar medicine bags used by the Winnebago, the Plains Indians, and in California.

In the light of modern Shoshonean games, the archaeological evidence of the cup-and-ball game from Basket-Maker I gives some notion of ancient pastimes. It seems safe to assume the antiquity of Shoshonean dice games, since stick and bone dice are found in Basket-Maker I at Lovelock Cave. No archaeological evidence is forthcoming to prove the antiquity of the Aztec dice game of patolli, the present distribution of which embraces the Sonoran Uto-Aztekan, the Diegueño, the Pueblos, and the Kiowa. The game was undoubtedly of prehistoric existence, despite the lack of archaeological evidence of boards upon which it was played. The game involves a system of play and of counting that is nowhere seen in the wide distribution of simple dice games using the same dice and tallies. Since no intermediate forms of

the game appear, the possibility of the diffusion of the Indian game parchesi cannot be conclusively denied. Finds of wood and stone balls give some evidence of historical depth to the universal and characteristic Uto-Aztekan game of foot-ball kicking races.

There is ample archaeological evidence to prove that the modern Great Basin Shoshonean use of California shell goes back to Basket-Maker trade relationships between the two regions. The modern pueblo turquoise ear-pendant appears to be a transfer from a southern California shell-form of pendant. Steatite pipes and ceremonial cylinders also entered this ancient Uto-Aztekan trade.

Nor is evidence from California completely lacking of the goods and services returned as a result of this trade. As far north as the San Joaquin Valley a typical classical Basket-Maker twined bag and pueblo cotton blanket appear. Besides goods in this economic exchange, evidence of shamanistic services are indicated in the presence of the sand-altar of simplified Southwest Pueblo pattern in use among the southern Californians. This striking cross-tie indicates a considerable possibility that priests from the Southwest may have traveled the prehistoric trade routes offering their priestly services. Such services might be much in demand among tribes with a less developed ritual; just as the Huichol shamans today are widely known and esteemed by neighboring tribes for their sacerdotal services.

The correspondence between the culture of the Shoshoneans of the Great Basin and of southern California with that of the ancient Basket-Makers is tabulated in the following chart.

TRAITS IN BASKET-MAKER "PROTO-UTO-AZTEKAN"

CULTURAL SUB-STRATUM

Southern Californ- ia Ar- chaeology	Southern Californ- ia Uto- Aztekan	South- ern Utes	Basket- Maker II	MATERIAL CULTURE TRAITS	Basket- Maker I	Northern Paiutes
Animal and Vegetable Food						
	←→	←→	←→	Piñons Acorns Rabbits Insects and reptiles		←→
Clothing and Personal Decoration						
	←→		←→	Twisted fur blankets	←→	←→
	← ? →	←→	←→	Tanned buck- skin	←→	←→
	←→		←→	Fiber apron skirt	←→	←→
	←→		←→	Sandals	←→	←→
	←→		←→	Moccasins	←→	←→
←→			←→	Olivella shell	←→	←→
←→			←→	Abalone shell	←→	←→
Household Appurtenances						
←→		← ? →	←→	Twined bags	←→	←→
←→			←→	Hoop cradle		←→
	←→		←→	Coiled trays		←→
	←→		←→	Coiled bowls		←→
	← rare →	←→	←→	Coiled carry- ing basket		←→
	← twig →	← fan →	← twig →	Seed beater		←→
	←→		←→	Earth oven		←→
	←→		←→	Digging stick	←→	←→
	←→		←→	Simple drill- hearth	←→	←→
	←→		←→	Metate-mano	←→	←→
Totals	19	18	19		11	13

TRAITS IN BASKET-MAKER "PROTO-UTO-AZTEKAN"

CULTURAL SUB-STRATUM

(Continued)

Southern California Archaeology	Southern California Uto-Aztekan	Southern Utes	Basket-Maker II	MATERIAL CULTURE TRAITS	Basket-Maker I	Northern Paiutes
Weapons and Hunting						
	↔		↔	Atlatl	↔	
	↔		↔	Dart-arrow	↔	
	↔ ? ↔		↔	Rabbit-net	↔ ? ↔	
			↔	Rabbit clubs	↔	
			↔	Hafted knives	↔	
			↔	Horn sizer-wrench		
			↔ ? ↔	Fig. 4 stick-string trap	↔ ? ↔	
	Pomo-Yahi ↔		↔	Deer net noose		
Ceremonial Artifacts						
	↔	↔		Nicotiana attenuata		↔
	↔		↔	Tubular pipe	↔	
			↔	Double bone handle for rattle	↔	
	↔		↔	Feather wands	↔	
	↔		↔	Bunches of feathers	↔	
	↔ ? ↔		↔	Medicine bags		
Game Paraphernalia						
		↔	↔	Bone dice	↔	↔
		↔	↔	Stick dice	↔	
	↔		↔	Kicking foot-ball	↔	↔
Totals	10	12	16		11	8
Brought forward	19	18	19		11	13
Combined Totals	29	30	35		22	21
Percentage Basket-Maker II Culture in South Ute and S. California				Percentage Basket-Maker I Culture among N. Paiutes		
	83.83%	85.7%				95.5%

Close correspondences are seen in the fundamental cultural patterns of food-gathering and subsistence, clothing and personal decoration, household appurtenances, weapons and hunting, ceremonial artifacts, and game paraphernalia. Such correlations project Shoshonean culture back to Basket-Maker I antecedents. It must therefore be concluded that under conditions of a desert environment and extreme isolation, aboriginal American culture in these regions has retained the essential patterns of its ancient outlines, and that the modern Shoshoneans are the cultural survivors of this ancient sub-stratum. This culture has been preserved in its main outlines for the two thousand years that separate Basket-Maker remains from modern times. Thus we have a picture of a culture that may have been static for millenia before.

The author's conception of Uto-Aztekan culture history is that these tribes entered a wide-spread area of pre-existing Basket-Maker culture. They took over much of this culture, and archaeological remains of it are the earliest "proto-Uto-Aztekan" culture of which there is evidence. The Shoshonean rear-guard of the movement retained many of the essential patterns of this culture, while evidence will be presented (p.182-9) that the main body moved into Northern Mexico, taking a variant of this "proto-Uto-Aztekan" culture with them.

Thus the "Digger" Shoshoneans of both the Great Basin and southern California are brought clearly into the Southwest culture area as survivors of the cultural sub-stratum from which was erected Pueblo culture given Uto-Aztekan representation by the Hopi (see Chapter IV).

CHAPTER IV

THE DEVELOPMENT FROM "PROTO-UTO-AZTEKAN"

TO HOPI CULTURE

Introduction: Problems in the History of Hopi Development

Basket-Maker II and III

Food and Food technology

1. Corn and squash
2. The development of pottery
3. The cultivated dipper-gourd
4. The use of the turkey for food and clothing

Textile techniques

5. Textile spinning and weaving
6. Twilled basketry possibly a diffusion from Mexico

Structures and house-types

7. The Basket-Maker III dwelling and its retention in the Pueblo kiva
 - a. The atrophy of the Basket-Maker III entry-way into the modern kiva ventilating shaft

Minor culture

8. Technology of woodworking and the stone ax
9. Evidence of California trade in Basket-Maker III
10. The atlatl-dart and bow-arrow problem in Basket-Maker III

Summary and Conclusions on Basket-Maker II and III

The Pueblo Phases of Southwestern History

Pueblo I

Pueblo II

Pueblo III

Pueblo IV in the Little Colorado

CHAPTER IV

THE DEVELOPMENT FROM "PROTO-UTO-AZTEKAN" TO HOPI CULTURE

Introduction: Problems in the History of Hopi Pueblo Cultural Development

The second aspect of the Shoshonean historical problem involves the drift in Hopi history which has made them a typically Pueblo group of Uto-Aztekan with a highly developed culture strikingly different from both that of the modern "Digger" Shoshoneans and from that appearing in ancient Basket-Maker archaeology. Can Hopi culture be traced back to Basket-Maker Archaeology and hence to cultural relationships with the other Shoshoneans?

In the arid terrain of northern Arizona the Hopi practice a characteristic Pueblo culture centering about their compact villages. Perched on the tops of mesas, these villages of stone and mud houses are so compact as to give an impression of communal houses. These large cohesive villages shelter a considerable aboriginal population in a well integrated native culture that has successfully resisted all attempts at white assimilation. The population supports itself by the harvest of beans, corn, and squash produced by a skilled aboriginal agriculture which utilizes the meager rainfall and underground water of this desert region. Water and corn are vital to Hopi culture and

motivate a complex system of technological, social, and religious institutions.

No greater cultural contrast in aboriginal America exists than between those of the Hopi and the "Digger" Shoshoneans. Many bands of the latter wander much of the year in small familial groups in a constant quest for food in a desert environment. Starkly crude, the technology of many of these tribes scarcely exceeded that of the Australian blackfellow. The technological system provides a minimal human control over the natural environment exercised by the use of crude shelters, fire, the earth oven, the digging stick, the spear-throwing stick and stone tools, etc.

The social organization of tribes on so primitive a subsistence level as that of the "Digger" Shoshoneans was necessarily simple. In the Great Basin the principal social structure was maintained by the family and the band living within territorial limits with property rights to water-holes and the seeds growing around them.¹ The communal hunt for rabbits and ducks under the authority of an elected leader appears as the only inter-family institution not attributable to recent historical contacts, such as those with the Plains Indians. The hunt, and possibly war, called the bands together for dances, but little is known of this aspect of Great Basin culture. The southern Californian Shoshoneans developed a distinctly more elaborated social structure of clans and moieties, following aboriginal Californian patterns. Their religious organization is also more complex. Crisis rites, initiation ceremonies, curing and funerary customs find a much more formalized expression in southern California than in the Great Basin. Definite cults also distinguish

¹R. H. Lowie: Notes on Shoshonean Ethnography, pp. 284-285.

southern Californian religion from both the Southwest and the Great Basin.

Both branches of the "Digger" Shoshoneans reveal a simple cultural set-up when contrasted to the panoply of Hopi Pueblo culture. Here is a social integration as cohesive as the houses of their beehive-like villages. Hopi culture is oriented about the village, and social participation pervades their culture to an unusual degree. Most of Hopi behavior is institutionalized by a strong socio-religious structure. Agriculture, technology, individual crisis periods, curing, ritual, and even art are expressed within a rather rigid framework of clan and secret societies.

In striking contrast to the individualistic "Digger" Shoshonean culture, the Hopi socialize almost all expression. Individual shamans do not gain personal power by a dream experience; Hopi curing is done by a society of priests.¹ Throughout all Hopi and other Pueblo culture an elaborate ceremonial structure reinforces the social organization as a ritual expression of the social participation that so completely fills the life of the individual Hopi.

In externals, "Digger" and Pueblo Shoshonean culture diverge as widely as in esoteric culture. This divergence is seen throughout the material culture: subsistence, technology, house-type, ceremonial structures, and the material paraphernalia of social and religious culture.

In modern times, the Hopi retain an ecological and ceremonial importance placed on rabbits, using a curved rabbit-stick

¹Ruth Benedict: Cultural Configurations, gives a suggestive treatment of other Pueblo patterns which differ sharply from other aboriginal cultures.

and making fur blankets. In ceremonial paraphernalia they preserve another characteristic Basket-Maker technique in coiled basketry plaques. It is patently inadequate to posit a genetic relationship between the modern Hopi and the ancient Basket-Makers on such inconsequential correlations. But some general considerations indicate the possibility of such a genetic relationship. The Hopi are the Pueblo group geographically nearest the classical Basket-Maker region of San Juan. Second, the Hopi speak a language genetically related to that of the "Digger" Shoshoneans, --the latter still preserve many patterns of an early "proto-Uto-Aztekan" culture (p.115).

Other hypotheses than the development of Hopi culture from Basket-Maker antecedents may be adduced to account for the linguistic relationships of the "Digger" Shoshoneans and the Hopi. Dr. Fewkes, with much erudition gained in actual field study of the Hopi, conceived their history as resultant from an incorporation of a band of Shoshoneans from the Great Basin into an already well developed Pueblo culture. Despite some temerity, the present author presents a conception of Hopi history which is diametrically opposed to that of a scholar whose work is so voluminous and valuable. Fewkes' interpretation is open to question since it was based principally on studies of the legends of clan migrations, treated as valid historical documents. This interpretation of folk-lore is open to serious question when not confirmed by other historical data.

Later linguistic evidence does not bear out Fewkes' interpretation. Hopi language is not closely related to the other Shoshonean languages. Kroeber¹ shows that Hopi is as far removed

¹A. L. Kroeber: The Shoshonean Dialects of California.

from the languages of the Great Basin as it is from the southern Californian Uto-Aztekan languages. He therefore concludes:

The Hopi have therefore been a separate people for a considerable period; and this circumstance makes it probable that they have been a Pueblo people for a very long time.

The evidence of linguistics shows that the Hopi have been isolated from the Great Basin Shoshoneans for about as long as from those of southern California. This carries a general suggestion that the ancestors of the Hopi were among the Basket-Maker peoples of the San Juan near by rather than among the Shoshoneans farther north in the Great Basin. Such a view seems more acceptable since it does not require us to answer the question as to how an isolated band of Shoshoneans could have quickly taken over the full panoply of Pueblo culture. The Hopi have a typical Pueblo culture, the integration and complexity of which bespeak a long history.

The detailed demonstration of the probability of genetic relationships between Hopi, Shoshonean, and Basket-Maker culture will be found in the archaeological material that has been uncovered since Fewkes' time. From this material has already been deduced a correspondence between the material culture of the ancient Basket-Makers and that of the "Digger" Shoshoneans sufficient to allow the argument that the modern culture is a survival of this ancient "proto-Uto-Aztekan" sub-stratum. From the material of archaeology, can Hopi history be traced back to the classical phase of the Basket-Maker horizon in the nearby San Juan drainage?

Early interpretations of Southwestern archaeology sharply differentiated Pueblo and Basket-Maker cultures. Dr. Kidder more recently, however, shows the historical development of Pueblo

culture through a series of early Pueblo phases.¹ The archaeological work of the last few years has not only substantiated this seriation but also has obliterated any sharp cultural line dividing Basket-Maker and early Pueblo culture.

The earlier criteria for differentiating Pueblo from Basket-Maker culture were:

1. The use of pottery
2. The agriculture of corn, beans, and squash
3. The cultivation of the dipper gourd
4. The use of the feather rope instead of rabbit-fur in blankets
5. The domestication of the turkey
6. The technique of true weaving
7. The use of cotton in weaving
8. The basketry technique of wicker-work and twill instead of coiling
9. The use of the bow and arrow instead of the atlatl and dart
10. The square house type
11. The subterranean round kiva with a fireplace, deflector, and sipapu as characteristic structural features

Recent work in San Juan archaeology reveals all of these traits and techniques in Basket-Maker II and III with the exception of beans, direct evidence of domestication of the wild turkey, weaving in cotton, and square house-type. These are minor elements, and in the Basket-Maker phases are outlined at least the beginnings of the important distinguishing features of modern Pueblo culture.

The Pueblo kiva is crucial in this historical problem, because it is of great functional importance in modern Pueblo culture. The kiva is the ceremonial room for much of the elaborate ritual and the complex social organization which runs throughout the Hopi culture. This ritual gives Pueblo culture the strong socio-religious configurations which distinguish Pueblo from other American cultures. The kiva is the Pueblo school,

¹Dr. A. V. Kidder: Introduction to the Study of Southwest Archaeology.

theater, church, the men's club-room, and the place of boys' initiations. Just as Pueblo life centers in the village, so the kiva provides the setting for most of the representative expression of that village solidarity.

The Pueblo kiva is generally semi-subterranean and round. It is entered through a hole in the top and is ventilated by a special shaft. In front of the shaft, a deflector slab protects the ceremonial fire from draughts. The fireplace is located in the center of the room, and about the fire-place revolves much of the ceremonial and symbolic representations of Pueblo culture. No less characteristic nor significant in Pueblo religion is the symbolism that is expressed in another constant feature of the Pueblo kiva, the sipapu, a small hole in the floor of the kiva near the fireplace. This is the sacred place of emergence of the clan ancestors. Hence this particular spot is indeed the focus of the symbolic and representative ritual expression of Pueblo life, so strongly centered in the village. The sipapu is the most significant of the many collective representations in Pueblo culture because it is the origin and the center of the whole elaborate socio-religious structure.

If it is accepted that the sipapu is a collective representation of Pueblo culture, it is of unusual significance that the ancient Basket-Maker III dwelling structure was provided with the sipapu, as well as deflector-slab, and fireplace. Sociological theory substantiates the archaeologist's interpretation that the sipapu in the household dwelling represented the place of emergence of the ancestors of the family group. The Basket-Maker sipapu is so similar to the Pueblo sipapu in the whole complex of fireplace and deflector-slab that its position in the individual dwelling, instead of in the communal structure of the

Pueblos, strongly suggests that it was the collective representation of the solidarity of the household group. The representation is so strikingly similar in both cases of Basket-Maker and modern Pueblo as to furnish the strongest link of all in connecting them historically. Obviously similarity in representations indicates a corresponding similarity in the things represented.

Basket-Maker III archaeology provides concrete demonstration of the earlier theories that the modern Pueblo kiva represents a ceremonial survival of the earlier round house type. In addition, if Durkheim's generalization that religion is a structural projection of social organization is accepted, this Basket-Maker dwelling is significant, suggesting that Basket-Maker III social organization was familial, the household furnishing the primary social group about which Basket-Maker culture was oriented.

The Historic Development of Pueblo Culture

In Basket-Maker II and III

Archaeological material gives no indication of a sudden cultural shift in early pueblo times to indicate a migration into the region of powerful people with a new culture who dis-planted and blotted out the simple Basket-Maker culture, and superseded it with another fully developed culture.

The interpretation of the archaeological and distribu-tional evidence reached by the author is that the epochal shift of native culture in the Southwest occurred between Basket-Maker I and Basket-Maker II as defined by the introduction of corn and squash from Mexico. The numerous sites of the Basket-Maker II horizon are seen as the remains of a more sophisticated technological culture developed on the basic patterns of Basket-Maker I Lovelock Cave and found among the surviving Basket-Maker I peoples in the Great Basin and southern California. This appears to have resulted from a shift in subsistence base, making possible a greater control of the natural environment essential to cultural advance.

The classical phase of the San Juan is of particular interest to this study because of its possible relationship to Uto-Aztekan history as genetically antecedent to Hopi culture. The classical Basket-Maker culture is a refinement of the Basket-Maker I patterns of food preparation, clothing, tools, weapons, and ceremonial objects, all of which argue for a skill and care in manufacture made possible by the leisure enabled by the agriculture of corn and squash.

Food and Food Technology. History of Pottery in the Southwest

Archaeological evidence suggests the early imperfect mastery of agriculture and a retention of the simpler technological food patterns in the remains of mountain rice (Oryzopsis hymenoides), pine-nuts, acorns, sunflower and Coreoparpus seeds¹ found in the classical sites, as elsewhere in the archaeological horizon.

But the beginnings of a significant change in the techniques of food preparation have appeared. Nowhere in Basket-Maker II are found the charred basketry trays, diagnostic of the parching of cracked seeds with live coals. Instead are found the simplest typological prototype of pottery: sherds of mud, bearing the impress of coiled basketry to prove that trays had been lined to prevent burning. Such sherds, often with vegetable tempering, have been found not only in the Kayenta² but also in the marginal Basket-Maker II site on the Upper Gila³ where rude pottery was also present.

This pattern is still preserved in the Southwest among the Havasupi of Great Basin affiliations, who are seen in Cushing's report to use a roasting tray lined with coiled clay and sand. "That this clay would grow hard with continual heating and in some instances separate from its matrix of osiers is apparent. The clay form naturally fired would itself be a perfect roasting vessel." What evidence can be marshalled pro and con the thesis of Southwest pottery inventing itself in such a fashion?

In 1886 Cushing, from his long first-hand familiarity

¹Kidder and Guernsey: 1919, pp. 155-56.

²Ibid., 1921, p. 98.

³Hough: 1914, p. 46.

with Pueblo culture, argued the case for the evolution of Pueblo pottery from this sort of coiled basketry to the typologically somewhat similar corrugated pottery. Such a thesis can no longer stand against the archaeological evidence for Kidder shows that corrugated pottery is a rather sophisticated Southwest type,¹ well developed black-on-white being antecedent.

Morris summarized the evidence in existence by 1927² to indicate the independent development of pottery in the Southwest. He says:

A tabulation of the data relative to clay containers reveals that in the Canyon del Muerto collection there are sherds to represent 96 unfired vessels. Of these 54 were moulded in coiled baskets, and two in pleated receptacles; while 40 seem to have been built up without the use of moulds. Vegetable temper is present in 51 basket moulded specimens; and in 25 of the plain specimens; or a total of 78.... The vegetable temper is shredded cedar bark in 74 cases, chaff or corn tassels, or grass heads. Most if not all the specimens without vegetable temper had temper of more or less sand. Of the 15 plain vessels without vegetable temper, 3 may have been intended to be fired, and hence not necessarily contemporaneous with the rest.

For Basket-Maker III true pottery has not displaced this crude pattern; for according to Guernsey:³

In practically every Basket-Maker III site that was found in the shelter of a cave there occurred in the rubbish fragments made of unbaked clay. While no whole or even nearly complete specimens were recovered, the pieces show that they once formed parts of shallow dish-like or tray-like receptacles, 18 inches to 2 feet or perhaps even more in diameter by 5 or 6 inches deep. They were made of dark adobe mud mixed with a large amount of shredded juniper bark.

An important technological difference appears in the next sentences:

Partly unobliterated horizontal striations on their external surfaces show that they were built up (near the rim

¹Kidder and Guernsey: 1919, p. 142.

²Morris: The Beginnings of Pottery in the San Juan Area, p. 159.

³S. J. Guernsey: 1931, p. 85.

at least) by the same coiling process used in pottery making, the structural coil or roll being, however, much heavier than that used for true pottery.... The exteriors show that many of the dishes were made in baskets, the print of the fabric being very clear in some cases. The heavy perforated lugs or ears often attached to the upper sides are characteristic.

The similarity of these Basket-Maker III specimens to the Havasupai coiled lining for roasting trays is striking, considering the millenia that separate their occurrence.

Logically, seriation evidence of this sort from a local region of well worked out archaeological culture must be admissible as a demonstration of the hypothesis of local development, unless distributional evidence can offer more convincing data of diffusion.

The evidence for the diffusion of pottery from Asia is admittedly not strong.¹ The thesis of the diffusion from Mexico of the characteristic Pueblo coiled technique is not strengthened by finding conclusive evidence of a distinct technological principle of the anvil and paddle technique in the ancient Colonial Hohokam of the lower Gila.² The distribution of this anvil and paddle technique isolates the Pueblo distribution of coiling from the wide-spread Mexican distribution of this technique. The Tarahumara pottery of southern Chihuahua, though coiled, presents no evidence ancient or modern of any specific relationship with the Southwest. From a thorough study of the distribution of the Pueblo principle of coiling and the distribution of the anvil and paddle method, Gifford, certainly without evolutionary bias, concludes in part:³

"The likelihood of the independent development of pottery

¹E. W. Gifford: Pottery Making in the Southwest, p. 371.

²Haury: 1932, pp. 64-5, Pl. XX.

³Gifford: op. cit., p. 371.

in the Pueblo Region (of the Four Corners) apart from its development in the Middle Gila (Hohokam) and westward is strengthened.

The present author therefore inclines to the view that all the facts are best accounted for by the hypothesis of the local independent development of ceramics in the San Juan-Kayenta Four Corners Region into the characteristic types of black-on-white, red, and corrugated pottery in the Post Basket-Maker phase as given by Guernsey.¹ This conception does not preclude the possibility of the diffusion of a generalized pottery pattern, which may have followed corn and fertilized the tentative ceramic experimentation of the Basket-Makers, for which the evidence may well be these unfired sherds. It is almost inconceivable that corn should have brought the metate and lime techniques for metate bread without bringing some conception of pottery, an essential for these techniques. The diffusion of these elements was not necessarily synchronous. Corn may easily have prepared the culture for the ready acceptance of the others as later elements, which again is indicated by the Basket-Maker remains. The thing most significant for this study is that the technology of food preparation began a change in Basket-Maker II which shifted in the later phases of Pueblo history from basketry to pottery.

The cultivated dipper-gourd.-- Another important trait, the cultivated dipper gourd (Lagenaria vulgaris), appears in Basket-Maker archaeology. The plant is of world-wide distribution and grows in the New World only under cultivation. The wide historical implications of prehistoric introduction of this plant cannot be gone into here. It is suggestive in the wide

¹S. J. Guernsey: 1931. Tabular summary.

cultivation of the plant in Mexico for a characteristic use in domestic utensils that the Basket-Maker dipper gourd may well be a Mexican introduction. Unfortunately, the archaeological specimens have not been sufficiently examined to assume that the gourds are of the species Lagenaria vulgaris Ser. There are several wild gourds native to the Southwest, Cucurbita foetidissima H.B.K., Cucurbita digitata Gray, and Apodanthera undulata.¹ Squash and pumpkin are closely related and are commonly known in archaeological literature as "gourds." The gourd problem merits ethnobotanical research.

Gourds appear as rare first in the classical Basket-Maker at the type site of Grand Gulch. They are provided with attachments of yucca string for carrying and their possible use is for carrying water.² Morris found a cache of gourds in a Basket-Maker III storehouse in Canyon del Muerto.³ In the marginal horizon, the prominence of gourds increases towards the South. In addition to gourd dippers, Tulerosa Cave, in the upper Gila, yielded gourd receptacles for seeds,⁴ while from the Ozark Bluff-Dwellers many utensils were found made from this plant-shell.⁵ Farther south, the archaeology of the Rio Grande Big Bend country in Brewster County, Texas, yielded many sherds of gourd vessels many of which were mended by sewing,⁶ an indication

¹Russell: The Pima Indians, p. 91.

²Pepper: "The Ancient Basket-Makers of Southeastern Utah," Amer. Mus. Jour., Vol. II, No. IV, Suppl., 1902.

³Morris: 1925 National Geographic, No. 3, p. 272.

⁴Hough: 1914, pp. 9-10.

⁵Harrington: 1926, p. 6.

⁶Coffin: 1931, p. 34.

that some considerable value was attached to them. In this, as in many other elements, the Big Bend archaeology is affiliated with Tarahumara archaeology, which might be expected from their situation, without implication of any specific relationship. Among the Tarahumaras today dipper gourds are more commonly used in eating and drinking than is pottery. In the prehistoric horizon gourds were treated with the "cloisonne" characteristic of ancient Toltec pottery.

The prominent use of the plant for utilitarian purposes in Mexico as well as the Mexican decorative elaborations on the dipper gourd suggests this region to be a source of its spread into the Southwest. This is borne out by the northern attenuation in frequency in the archaeological horizon. There is a strong typological suggestion that the characteristic ladles in the pottery of the early phases of Pueblo history may well represent a transference into clay of the gourd dipper pattern which would have inhibited the technological specialization with the gourd.

Use of the turkey for food and clothing.-- Classic Basket-Maker II yields no evidence in pens or droppings of the domestication of the turkey. Yet the utilization of the fowl is proved by the finding of a dessicated mummy in the original Four Corners site, reported by Montgomery.¹ In the marginal phases, turkey bones are reported from the Ozark Bluff Dwellers of Arkansas;² and not only a mummy but a pen with quantities of droppings, dessicated chicks, and a number of eggs from Tulerosa Cave³ are conclusive evidence of domestication. This, however,

¹Montgomery: "Prehistoric Man in Utah," The Archaeologist, Vol. II, Nos. 8, 10, 11 (1844).

²Harrington: 1926, p. 4.

³Hough: 1914, pp. 5-6.

does not argue for a Basket-Maker domestication of the turkey since later material is also present at this site. In the classical phase the evidence of the turkey is so rare that its domestication is rightly to be placed in the Pueblo phases.

But even in Basket-Maker times the turkey was a casual source of food, apparently. Evidence is conclusive that it provided the material for a new technological principle of clothing manufacture--that of twisting the stripped pile of large turkey feathers for use in fur and feather blankets. In the classical Basket-Maker II phase, specimens of feather string are of three kinds. One is twisted strips of downy skin just as at Lovelock Cave, another is a new technique of using whole turkey feathers, and runs throughout the Basket-Maker II horizon, being typical for the author's southern Chihuahua material, though other techniques in both fur and feathers are also present. The third feather technique, corresponding to a fur method, is that of twisting tufts of feathers (like bits of skin) by catching them in the twists of the basic cords.

The classical Basket-Makers used this feather string only for ornamental edgings, tassels, bands, lashings, etc.,¹ whereas in Pueblo I, feather fabric has practically displaced fur cloth. Feather cloth is reported for nine out of ten cases. The change from Basket-Maker II in fur and feather clothing to Pueblo I is seen to be one of degree, not of kind. Despite the change in physical type between Basket-Maker III and Pueblo I, as seen in the totality of the culture the sharp break in Southwest aboriginal history is between Basket-Maker I and Basket-Maker II upon the introduction of corn. If the change in physical

¹Kidder and Guernsey: 1919, p. 174.

type is due to a new population admixture, which appears likely, one is at a loss to demonstrate any significant cultural traits that they introduced except possibly the square "jacal" house, domestication of the turkey, and the cultivation of cotton.

Textile Techniques

Spinning and weaving.-- Another and distinctly new textile technique enters the classical Basket-Maker phase and not in the early Pueblo phase to correspond with the change in physical type. This is the technique of true weaving, of apocynum fiber into blankets with button-hole selvage.¹ A Mexican source for this technological principle in the Southwest is indicated by the finding of similar blankets with the same kind of selvage in the cave material from Coahuilla, Mexico, of general Basket-Maker affinities.² In the author's southern Chihuahua Basket-Maker material, blankets of true weaving in abave or yucca fiber but with weft selvage were common. These were standard funerary equipment, the body being then wrapped in feather cloth and finally in a twilled mat or petate. Here to the south, the use of true weaving was characteristic rather than rare, as was its occurrence in the classical San Juan phase. This may indicate southern Chihuahua as nearer the center of the diffusion of the weaving technique. This conclusion is tentative since there is no evidence of the contemporaneity of the two Basket-Maker phases.

Knowledge of the Basket-Maker loom is practically a

¹Kidder and Guernsey: 1921, pp. 63-5.

²Vaillant: Some Resemblances in Ceramics, p. 4.

blank, but Guernsey's account of the Basket-Maker III type of spindle gives perspective on the spinning technique antecedent to the wooden spindle whorls from the "Cliff House" culture of the Kayenta.¹ Guernsey reports from a "number of caves, sticks bound together in the form of a cross; one of which was bundled with a hank of human hair and a small amount of hair cord in the process of making."² This, like so much of Basket-Maker archaeology, is a perfect datum to establish the technological principle, and is made more strikingly like many other ancient evidences of techniques, because in the Southwest it is still found in practice.

This same crude type of cross-stick spindle was still used by the Pima in Russell's time. He says:³

The spindle was about 18 inches long with a single fly of four to six inches. Illustrated clearly as of cross form similar to the archaeological specimen.

The technique of manipulating the spindle is sharply different from the thigh rolling method now seen in the Pueblos. Russell continues:

One end of the spindle rests on a wooden cup inserted between the toes, while the other end is twisted by the fingers of the right hand, while the left hand is occupied with drawing out of the thread from a supply of cotton which is coiled on the left arm in loose rolls.

This Pima method of holding the spindle in a cup inserted between the toes suggests a similar function for the Basket-Maker III "funnel-shaped unbaked clay objects" (not cloud-blowers) in the same report.⁴ They are of suitable size and

¹Kidder and Guernsey: 1919, p. 121.

²S. J. Guernsey: 1931, p. 82, Pl. 31 f.

³Frank Russell: The Pima Indians, pp. 148-49, Fig. 73.

⁴S. J. Guernsey: 1931, p. 87, Fig. 26.

shape for inserting between the toes.

Basketry

Coil Basketry and the beginnings of twill as a diffusion from Mexico.-- The basketry of the classical phase of the archaeological Basket-Maker horizon corresponds to the others in being almost exclusively coiled. Coiled basketry was used in such artifacts as trays, carrying baskets, water-baskets, and bowls. This phase reveals the barest entrance of another technological principle of basketry manufacture, which later becomes very important in Pueblo basketry while coiling disappears. The new basketry technique is twill, both diagonal and plain plaiting.

From the classical phase, twilled baskets are very rare, contrasting with their frequency in succeeding early Pueblo phases;¹ but it is significant that they do occur in Basket-Maker and therefore cannot be attributed to an invasion by the later short-headed Pueblo people. The ring-topped twilled baskets are described and illustrated by Pepper from Grand Gulch,² and are recorded in unquestionable Basket-Maker stratification by Kidder and Guernsey.³ These baskets of "under two, over two" twill are so crude and experimental as to belie a well mastered technique. Characteristically by the expert Tarahumara weavers, twill is worked by weaving from the bottom to the top which is finished by a secure selvage made by doubling the fibers back on themselves.

¹J. Guernsey: 1931, p. 108.

²Pepper: "The Ancient Basket Makers," (1902), pp. 23,25.

³Kidder and Guernsey: 1921, p. 108.

In the Basket-Maker specimens the technique is reversed according to Kidder and Guernsey.¹ To begin the process,

The butts of the leaves are turned outward over a heavy fiber cord that rings the mouth of the basket, and are fastened together by twined strings. The long ends of the leaves are plaited together over-two under-two, to form the body. The bottom is not woven, the last couple of inches of the leaves being simply laid across each other, and tied in that position with string.

The specimens are crude and imperfect, compared to both the later twilled work in the Pueblo archaeology and the excellent coiled basketry and twined bags of the Basket-Makers themselves, so that tentative experimentation with a new technological principle is indicated. Two lines of evidence counter-indicate the independent invention of twill in this area. First, it is strikingly different from pre-existing basketry methods in the classical phase; and second, the southern sites of the Basket-Maker horizon show a higher frequency of twilled work much more highly developed.

Checker-work of plain plaiting appears in Brewster County,² Texas: as a mat remade into a bag; and as a cylindrical checker-twill basket four inches high, possibly part of a fire making outfit. From the same region Setzler reports a high frequency of twill in a related culture.³ In the Ozark Bluff Dweller site, Harrington reports a high frequency of twill, some with decorative weaving similar to that of Louisiana; but he illustrates one⁴ which looks like Mason's "telescope" type found in the southern Chihuahua Basket-Maker. Here twill is more

¹Kidder and Guernsey: 1921, p. 63.

²Coffin: 1932, pp. 36-7.

³Setzler: "A Prehistoric Cave in Texas," Expl. and Field Work Smithsonian, Vol. 31, pp. 133-40.

⁴Harrington: 1926, p. 9, Pl. IV d.

frequent than coil, especially in twilled mats.

This progressive frequency in twilled work in the archaeological horizon toward the south and its present characteristic use in Northwest Mexico and among the Pima¹ gives indications of a source in this region for the technological principle of twilling, seen in crude experimentation in the classic Basket-Maker phase, which reaches a much higher frequency and greater development in the later Pueblo phases.

Fiber brushes.-- A minor, but specific Mexican trait among classical Basket-Maker household appurtenances is evidenced by three brushes from Cave I "quite different from the simple bunches of fibers more often seen."² These involve the principle of doubling the fibers over themselves to form a core, forming a pattern wide-spread in both the later Pueblo phases, and among the modern tribes of the region. Kidder and Guernsey illustrate a Mexican analogue from San Luis Potosi. As far south as the Huichols, this characteristic Mexican brush that can be bought in Mexican markets is found by Lumholtz, who attributes to its handle design symbolic significance.³ It may be significant that the Tarahumaras use only the simple type of brush for a metate brush, for the hair using the skeleton of a pine comb. The doubled fiber brush is used by the Pima,⁴ and is found among the southern Californians⁵ though apparently not ancient, since the archaeological specimens are a "shaving-brush" type with a

¹Frank Russell: The Pima Indians, p. 145.

²Kidder and Guernsey: 1919, p. 167.

³Carl Lumholtz: Unknown Mexico, Vol. II, p. 123.

⁴Frank Russell: op. cit., p. 116.

⁵Wheeler: op. cit., p. 250, Fig. 41.

handle of asphaltum. The doubled fiber brush is reported for the Paiutes and for the Pueblos for hair washing.¹ This distribution strongly suggests introduction from Mexico of a principle into the Southwest in Basket-Maker times, since when it has been diffused throughout the Uto-Aztekan area.

Basket-Maker House Types

The lack of dwellings with a hearth in the Basket-Maker II horizon has already been noted. But structures significant for this study do appear. Besides the "pot-hole" excavation for storage, another characteristic structure of the classical phase of Basket-Maker II is a semi-subterranean circular cist of upright slabs with or lacking adobe plaster. The Kane County, Utah, site yielded 31 such cists, 5 or more feet in diameter. Cist 28² gives good evidence of cribbed roof construction capped by a flat slab. This simple cribbed-roof type suggests a relationship with the Pueblo II cribbed-roof kivas of the "unit-houses" of Mesa Verde, featured by Prudden.³ Cist 30 of the Kane County, Utah, site has at its top a set-back of horizontal slabs which appears to have furnished the base for a similar cribbed roof.⁴ This set-back near the top of a semi-subterranean structure is a prototype for the Basket-Maker III storage cists shown by Roberts from Chaco Canyon.⁵

¹Wheeler: op. cit., p. 250, Fig. 41.

²Nusbaum: 1922, pp. 48-52, Fig. 3.

³Prudden: 1903, p. 234.

⁴Nusbaum: 1922, pp. 55-7, Fig. 4.

⁵Roberts: 1929, p. 92, Pl. 10 b.

From the Kayenta, Kidder and Guernsey report for Cave II similar round semi-subterranean structures of upright slabs. Cist 14 was found with remains of mud roofing, utilizing beam and cross-stick supports,¹ rather than the cribbed supports of the Kane County site. Isolated finds of surface pot-sherds do not belie this as Basket-Maker II. From Cave 14 the same writers later report the remains of such circular structures about 5 feet in diameter standing $3\frac{1}{2}$ feet above the surface. These also retained evidences of stick and adobe roofs which identify them with the previous structures.²

These are all probably storage structures, although it has been suggested that some of them might have been used for sleeping quarters.³ The Kane County structures were given second-

¹Kidder and Guernsey: 1919, p. 88, Fig. 33.

²Ibid., 1921, pp. 39-40, Pl. 9 e-f.

³It may be significant for interpretative perspective that the prehistoric Tarahumara cave-dwellers erected slab storage structures so similar to the classical Basket-Maker cists (Kidder and Guernsey, 1921, pp. 2, 12) that judging from the photographs they can hardly be distinguished. Other prehistoric Tarahumara storage structures could easily be mistaken for Kidder and Guernsey's "proto-Kayenta" structures (1929), Pl. 2, Pl. 10a and Pl. 12a; while modern forms closely approximate Pl. 19b.

It certainly would be fantastic to argue that the Kayenta peoples migrated to southern Chihuahua, or that diffusion between the two regions accounts for the similarities. Still the similarities are not due to mere chance as too many common factors are obvious. Both the Kayenta and southern Chihuahua have a common generalized "Basket-Maker" substratum; both cultures have an environmental setting in a high and arid semi-desert terrain offering innumerable caves for human occupancy. Corn was introduced into both cultures and the need for storage of food increased as a better mastery of agriculture yielded larger and larger crops for storage, with a corresponding lessening of dependence on day to day gathering of wild seeds for immediate use. Slabs and mud provided a more available resource to a primitive technology but poorly endowed with wood-cutting tools. These with innumerable other factors produced similarities, despite the wide geographic break in distribution.

From these considerations is derived the author's conception of the environmental and ecological factors operating as positive shaping forces in the moulding of technological culture, and to a less extent in the more independent variables of social

ary use for burial, as probably were the other storage structures. In the classical phase, flexed burials are more common in the "pot-hole" structures (probably also primarily used for storage), in shallow pits, and in small slab cists which were primarily used for burial.

The Basket-Maker III Dwelling and its Retention as the Pueblo Kiva

Basket-Maker II dwelling.-- There is no sharp fundamental break in house type or in other cultural remains to distinguish Basket-Maker III from Basket-Maker II and Pueblo I. It is a classificatory phase diagnosed by a specialized type of dwelling and the presence of true fired pottery. Fired pottery with characteristic painted decorations provides the most significant constant in the technological complex for chronological allocation of greater cultural variables into the phases of Pueblo history.

From the Kayenta, Kidder and Guernsey¹ describe a Basket-Maker II dwelling much like the storage houses. It is round, semi-subterranean with a peaked roof. The roof, probably of

and religious culture.

This is obviously not a conception of congeries of dissociated traits diffusing like ripples from a pebble dropped in a still pond--although diffusion is the most important process in cultural change. The Age-Area concept is a valuable theoretical concept, like the "frictionless icepond" in physics for idealizing the operation of laws of motion and momentum.

The present conception is far from a law of unilateral evolution, although the factor of the unity of the psychophysical mechanism of man necessarily meeting the needs of his environment due to the stern operation of a pragmatic sanction is obviously a significant factor in technological culture.

¹Kidder and Guernsey: 1919, pp. 43-4, Fig. 18.

earth, was supported on roof-beams which sloped up from a setback at the top of the pit, which the walls and floor of the house. Guernsey publishing the results of later expeditions to the same region concludes of the Basket-Maker II house type:¹

Houses were with circular foundation of upright slabs (Pl. 23 b-c; Figs. 8, 10, 14) with conical or truncate roof of poles covered with grass-mats, brush and dirt. Built in caves or in the open. The foundations are sometimes excavated.

Since knowledge of these phases for the Kayenta is meager,² the data available will be better understood in view of the extensions of the Basket-Maker III and Pueblo I phases throughout the Four Corners Region.

Basket-Maker III dwelling.-- Roberts gives this valuable distribution of the Basket-Maker III type of dwelling,³ which has a considerable extension:

Mr. N. M. Judd found a form of super-structure practically identical with those indicated by the ruins of Shabikeshchee village see next page in the remains of a dwelling not far from Pueblo Bonito where he excavated in 1922.⁴ Judd also reports a similar construction from the coverings of the earth-lodges which he investigated near Willard, Utah.⁵ The latter structures, however, seem to belong to a cultural phase more nearly approximating Pueblo I than the Basket-Maker III horizon. Doctor Cummings found a number of excavated circular rooms which had been roofed

¹S. J. Guernsey: 1931, Appendix.

²The Kayenta, the richest of all classical Basket-Maker regions, should also yield very valuable light in the early phases of Pueblo history. From here one would expect to find the missing links in Hopi history. Years of excavation by the University of Arizona under Professor Cummings has unfortunately never been published. Reference then can only be had to the results of a few seasons' work by Kidder and Guernsey, which while meager for Post-Basket-Maker phases (especially Pueblo I), are excellently recorded.

³Roberts: 1929, p. 13.

⁴Judd: 1924, p. 405.

⁵Ibid., 1926 b, p. 8.

over with poles, brush, cedar-bark, and plaster in the same region as the Kidder and Guernsey example just described¹ see preceding page. Mr. Morris reports the same thing from Mummy Cave in Canyon del Muerto, northeastern Arizona, where he found roughly circular pits which had had upper walls of posts set leaning inward and plastered over with mud, and the roofs of logs covered with earth.²

Dr. Hough found pole and brush coverings supported by posts in the pit ruins which he excavated near Luna, New Mexico, but the roofs were quite different in that they had a central pillar. These houses represent a later period and are not to be considered as Basket-Maker III dwellings.³

Dr. Linton found a conical type of superstructure, without interior support posts in Earth Lodge A on the Mesa Verde. This structure was unquestionably of the Basket-Maker III period.

Thus there is a wide distribution of the Basket-Maker III phase in all three sub-cultures of the San Juan drainage: Chaco Canyon, Mesa Verde, and the Kayenta, with a marginal occurrence near Willard, Utah. Roberts later found a specialized aspect of the Basket-Maker III house type and culture on the Little Colorado. Hough's find on the Upper Gila may eventually show some relationship to Pueblo, but more likely to a corresponding phase in colonial Hohokam,⁴ or the pit-houses of the Mimbres. This taxonomic Basket-Maker III horizon, while extensive, is considerably contracted within the Basket-Maker II horizon, and may prove to be a stage or a stratum within which ultimate historical relationships may be shown.

The San Juan. Basket-Maker III house type.-- From such simple beginnings of dwelling type, little different from the storage structures of Basket-Maker II, it is possible to follow Roberts' work which revealed the development of the Pueblo kiva

¹Cummings: 1915, p. 274.

²Morris: 1925, p. 272.

³Hough: 1920.

⁴Haury: Colonial Hohokam: Roosevelt, 9:6.

step by step from such an unspecialized origin. From Chaco Canyon in New Mexico Roberts reports a Basket-Maker III site so classified by its true coiled fired pottery without a slip but with black decoration giving a primitive black on overfired red phase of the late Basket-Maker III black-on-white.¹

Here was excavated the ruins of 18 dwellings, a kiva, a court, and 48 storage bins. The dwellings show several elaborations over the simple Basket-Maker III pattern already discussed. (P. 141). While still semi-subterranean round or oval rooms, the corners are often roughly squared. The walls are formed by slabs set in the sides of the pit. The floor, however, invariably shows the remains of the four post-poles supporting the superstructure, which has been reasonably reconstructed by Roberts:²

It is highly probable that the upper ends of the support posts had been forked to hold cross-beams. The latter would form a rectangular framework against which were placed the upper ends of small poles, the lower ends of which were embedded in the earth around the periphery of the excavation. [As in both the simple storage and dwelling structures in the Kayenta.] The rectangular space at the top probably had a flat roof with an opening at the center to serve as a smoke hole, possibly on occasions as an entrance.

The oval slab pit-houses are commonly divided into compartments and in the center reveal a rectangular fire-pit. Related to the fire-pit are two striking elements in this dwelling, significant for the record of the development of the kiva, one of the unique and characteristic things of Pueblo culture. In the floor near the fireplace is a simple hole, corresponding to the sipapu near the fireplace in a modern Pueblo kiva, as the most sacred representation in their elaborate socio-religious

¹Roberts: 1929, p. 109.

²Ibid., p. 11.

culture, representing the place of emergence of the ancestral clans.

This possibility of a sipapu prototype is greatly strengthened by the characteristic occurrence of a slab before the door of the dwelling to deflect the wind currents from the outside. In the modern kivas this characteristic "deflector" is situated before the ventilating shaft to serve the practical function of preventing the draughts from blowing smoke in the eyes of persons in the room. This association of the deflector and the sipapu suggests very strongly Roberts' interpretation that "it may well have been in the days when this village was occupied that each house had its own shrine, whereas in later times it was deemed essential only to the ceremonial house, the kiva."¹

Characteristically the Chaco Basket-Maker houses are connected by a passageway to a similar but smaller antechamber or entrance, sufficiently similar to the pit houses of certain Plains Indians, Eskimos, and the Northeast Siberians as to suggest that all of them may be a "development at different periods and along slightly varying lines out of a common ancestral form which probably had an Old World origin."²

But this possibility is not the only feature of interest about these passageways. Their situation with reference to the deflector, fire-place, and sipapu suggests the kiva ventilating shaft of the modern Pueblos, as vestigial preservation of an ancient entrance, which was Prudden's theory based on other more advanced finds. Roberts' excavation of protokiva house in

¹Roberts: 1929, p. 64.

²Ibid., p. 65.

the same Basket-Maker III village in the Chaco strikingly bears out the earlier theories.

In this structure there was a sipapu near a circular firepit in the center of the room, as well as the usual compartment. The deflector approached more closely the Pueblo kiva pattern in being independent of the compartment wall. The structure of the entrance passage-way was clear, being heavily plastered, and giving evidence of a roof of poles, brush, and plaster. The antechamber was found as usual at the far end of the passage.

This ordinary type of Chaco Basket-Maker III house, however, presents such striking evidence of the change of the passage-way into the kiva ventilating shaft, that one feels that the lucky archaeologist struck upon the site of the invention of the kiva.

The passage-way and its doorway had been reduced in size until what had originally been an entrance capable of actual use became a mere "ventilator." The changes which were made when the doorway into the room was made smaller were quite clearly shown because of the fact that when reconstruction was made a reddish-brown plaster was used, while the original was grey in color, due to the use of ashes in it. (Pl. 7c)(1)

The protokiva house definitely illustrated a shift from an older to a newer style, and what had once been an actual entrance became merely a representative one, a passage for bringing of fresh air into the chamber and one which quite probably had certain ceremonial significance. There seems to be little question but what this structure represents a domicile which had been remodeled with a view to more specialized ceremonial functions.²

The village yielded evidence of a large benched kiva³ suggesting an ancient prototype for the later great benched kivas from nearby Chettro Kettle and Pueblo Bonito. Significantly enough, this ancient kiva prototype lacks the modern sipapu,

¹Roberts: 1929, p. 64.

²Ibid., p. 65.

³Ibid., pp. 73-81; Figs. 24-25.

characteristic of Pueblo kivas, which in Basket-Maker III times was to be found in the domiciles. In view of the significance of the sipapu in modern Pueblo culture, as the mystical place of emergence of the ancestral clans, there is reason to think that in Basket-Maker III times familial integration was strongest and that each household worshipped the place of emergence of its ancestors. Later, as household solidarity extended to clan solidarity, the sipapu as the ancestral place of emergence was shifted to the kiva.

Roberts' summary of this aspect of the dwelling-kiva problem is penetrating:¹

Because of its large size and other characteristics the kiva is thought to be the possible prototype of the great kivas of the San Juan drainage, the centers of the major communal ceremonies. On the other hand, it is thought that the smaller kivas of the later periods Prudden's Pueblo II unit house and kiva were an outgrowth from the dwellings and the custom, during the earlier phase of holding minor ritualistic observances in them. As a part of this postulation it was pointed out that the entry passage of the earlier houses remained as the ventilator of the later ceremonial chambers and that there was a distinct survival of the deflector-fire-pit-sipapu complex, also, a continuation in a modified form of the compartment, features which place on a firm foundation the theories advanced by earlier investigators in the Southwest in their efforts to explain the development and characteristic elements of the kivas.

Basket-Maker III of the Little Colorado in Arizona

The atrophy of the Chaco dwelling entryway to the kiva ventilating shaft.-- That this striking phase of Pueblo development was not sporadic and unique is proved by Roberts' later find in the upper Little Colorado, in Arizona near the sacred lakes of the modern Zuni Indians.² That it is a slightly more

¹Roberts: 1929, pp. 147-8.

²Ibid., 1931.

elaborated phase is evidenced by the pottery, the full Black-on-white diagnostic pottery being common, although the ornamentation seems crude and wavering.¹

Here were excavated 18 pit-houses, "roughly circular, oval or rectangular pits, roofed over with a pole-brush-plaster superstructure....supported by four posts, placed upright in the floor, some distance from the walls."² The ruins indicate that "the upper remains were held by forked uprights carrying stringers which formed a rectangular framework....upon which the sloping section of the superstructure rested. The rectangular space at the top probably had a flat top with a single opening which served both as a smoke-hole and an entrance." Thus the shift is made from a lateral entryway to entrance from the top as in modern Pueblo houses and kivas.

The interior arrangements were simple. Near the center of the room was a fire-pit and adjacent to it toward the southeast a depression for the ladder used in entering and leaving, while almost invariably toward the northwest was the small circular hole, the sipapu found in Pueblo kivas, but here as in the Chaco placed in the dwellings.

The Little Colorado sites preserve the deflector, but have lost the Chaco passage-way from the anteroom to the entrance of the dwelling, before which the deflector stood. The Little Colorado deflector stands before a ventilating shaft as presaged by the Chaco protokiva house, and as surviving in the modern Pueblo kivas. These dwellings have all the essential kiva elements: general roundness in form, the entrance through the top,

¹Roberts: 1931, p. 130.

²Ibid., pp. 16-18.

the ventilator-shaft, deflector, fireplace, and sipapu. Thus from actual excavation is found striking verification of the earlier theories that the Pueblo kiva is a ceremonial survival of an ancient type of round house, while later archaeological elements were utilized in the secular every-day life.

Minor Basket-Maker III Culture

Storage structures.-- While Basket-Maker I Lovelock Cave reveals only "pot-hole" excavations for storage, the classical Basket-Maker II has been seen to yield a round slab storage cist with a slightly truncate mud roof supported by beams. This storage structure suggests a prototype for the simplest Post Basket-Maker houses described by Kidder and Guernsey (see p. 138ff.).

From Canyon del Muerto, between the Kayenta and the Chaco, Morris describes similar storage bins, with sufficient of the roofing in situ to show that they rested on the tops of the slab walls as "a jug-like neck of adobe, reinforced with sticks." The Muerto dwelling type is of the simple Basket-Maker type apparently,¹ being described as "12 to 25 feet in diameter with walls of posts leaning forward and plastered with mud with a roof of logs covered with earth; the dwelling being provided with a sunken fireplace."

From the Chaco, Roberts described small round pit storage structures, with a set-back at the top, reminiscent of both the Kayenta storage and dwelling structures within which rested the ends of the beams for the truncate or conical roofs. Thus

¹Morris: 1925 National Geographic, No. 3, p. 272.

there appears a close relationship between Basket-Maker II storage structures. There is a strong suggestion that the Basket-Maker II storage structure was developed into the Basket-Maker III dwelling which is still preserved in the Pueblo ceremonial kiva.

Technology of woodworking and the stone ax in Basket-Maker culture.-- That the Basket-Maker II culture made very little use of forest wood resources is clear from their remains, and from the lack of stone axes in the archaeology. Small twigs and branches were apparently shaped by scraping or sectioning with chipped flakes. From the marginal Tulerosa Cave site come "rejected scraps of sticks with a bunch of shavings at one end, as mute testimonials of the manner in which the cutting was done....by a sharp stone flake or knife for paring off strips by scraping pressure."¹ From the classical phase appear a few hammer stones, which might have been used for breaking limbs for firewood, but use for grinding paint, etc. is more clearly indicated.² Not until Basket-Maker III does there appear in the grooved maul a definite artifact for breaking wood. These are found both in the Chaco³ and the Little Colorado⁴ sites, where for the first time the use of wood in structures reveals the need of tools for heavy wood-working.

Stone axes, unknown for Basket-Maker II, are still rare in Basket-Maker III. Roberts concludes his examination of this problem:

¹Hough: 1914, p. 60.

²Nusbaum: 1922, pp. 125-26.

³Roberts: 1929, pp. 134-36.

⁴Ibid., 1931, pp. 155-56.

Future work may bring more specimens to light, but in the present state of our knowledge it would appear that the ax was a little used implement even in the Basket-Maker III period. Under such circumstances it is quite probable that the timbers necessary in the construction of houses were felled and the required lengths obtained by the means of fire. The butt ends of some of the timbers which are still in place in some of the ruins excavated suggested that such a method had been used.¹

One of the rare occurrences of the grooved ax in Basket-Maker III is in the Little Colorado site, where there were found excellent grooved axes, some of which are 3-sided grooves² recalling the three-quarter grooved ax from the Colonial Hohokam of the Gila River culture to the southwest.³

Evidences of California trade in Basket-Maker III.--

Nor is evidence lacking from this Basket-Maker III site of the ubiquitous trade with California in shells. Not only do olivella and abalone shell continue, but Basket-Maker III yields evidence of a new shell, Glycymeris, which was cut into sections for use as bracelets. In the Little Colorado phase of Basket-Maker III these shell bracelets are not uncommon, one of which was found with a well carved frog effigy, hitherto found only in the Gila region, being reported from Flagstaff, the upper Gila and Mimbres.⁴

In Basket-Maker III to the north, the Chaco site reveals only one fragment of a bracelet of Glycymeris,⁵ but carrying into Pueblo I as far northeast as the Piedras district of Colorado.⁶

¹Roberts: 1929, pp. 134-6.

²Roberts: 1931, pp. 155-6.

³Haury: 1932, p. 98, Pl. XXVIII a.

⁴Roberts: 1931, p. 172, Fig. 31.

⁵Roberts: 1929, p. 142, Pl. 30 a.

⁶Roberts: 1930, p. 155, Pl. 54.

Roberts states in his conclusion on the trade in Glycymeris shell in Basket-Maker III,¹

The shell used in the manufacture of bracelets is found only in the Gulf of California and shows that there must have been a spirited trade between these two areas. Farther south and west, i.e., the nearer the ruins are to the source of supply, arm ornaments are more numerous. In the northern and eastern portions of the southwest such bracelets are rather scarce.

The atlatl-dart and bow-arrow problem in Basket-Maker III.--- No direct evidence of the wooden atlatl or bow appears in Basket-Maker III due to the open situation of most of the sites which has resulted in the disintegration of these artifacts. However, stone points give some indirect evidence that throws light on the dart-arrow problem. By a minute typological comparison with Basket-Maker II dart points and knives, Roberts' analysis of tangs and notches gives evidence of dart points in the Basket-Maker III of the Little Colorado, but none for the superimposed Pueblo III material, which is consistent with this later horizon throughout the Southwest and all indicate that the dart had completely died out. Distinguished from dart points chiefly by the striking difference in size, the arrow heads in Basket-Maker III² give convincing indirect evidence that by this time the arrow had largely supplanted the Basket-Maker II dart. Roberts concludes his study of this problem:

As the Pueblo cultures progressed there seems to have been a decrease in the use of spear-points and a corresponding increase in arrow-points. It will be recalled that the early and classic period of Basket-Maker I and II had only the spear and spear-thrower and that the bow and arrow did not make its appearance until late in Basket-Maker III.... There is no evidence thus far to show it, but it is possible that the spear of later periods was of the thrusting rather than the hurling type. Certainly the spear-thrower or atlatl

¹Roberts: 1931, p. 163.

²Ibid., p. 158.

did not survive for any length of time, if at all, in the Pueblo area.

The thrusting spear or lance survived into modern times in the Southwest, the Apache being famous for its effective use in warfare. The Apache lance is not necessarily an adoption from the Plains, as first accounts of the Indians of Sonora in 1645 reveal the use of a "sort of pike the point and haft all made of Brazil-wood, which is commonly used by the chiefs."¹ The Tarahumaras still have a thrusting spear, which is likely a survival of this pattern, quite clearly pre-Hispanic and independent of the horse-complex.

¹Fr. Padre Andres Perez de Ribas: Historia de los Triunphos de Nuestra Fe, 1645, Madrid, p. 10.

Summary of Basket-Maker II and III

In the development of Southwest culture, its historians have found reason to distinguish within the wide Basket-Maker horizon, a Basket-Maker II archaeological phase diagnosed by the presence of corn. Within this horizon the classic Basket-Maker of the San Juan is genetically related to Basket-Maker III, based on diagnostic criteria which may be simplified to one type of slab-house dwelling, and coiled, fired pottery with crude black-on-white decoration.

The epochal event in the history of the culture of the Southwest was the introduction of corn. The Basket-Maker II horizon, especially the classical phase, has been seen as an elaboration and sophistication of the fundamental technological patterns seen in the archaeology of Lovelock Cave as well as still surviving among the marginal tribes of the Great Basin and southern California, despite later historical shifts in their culture. The elaboration of Basket-Maker II culture was in a large measure enabled by a shift in ecological base from food-gathering to a controlled food supply based on corn and squash.

Abundant evidence in caches of wild seeds prove that Basket-Maker II agriculture was at first imperfectly mastered, with a considerable dependence on the simpler food-gathering patterns being indicated. In techniques of food preparation Basket-Maker II gives ample evidence of a fundamental change. The experimental beginnings of pottery, which while probably stimulated by Mexican conceptions, represents an independent cultural growth in Pueblo history. Besides pottery, there is sporadic evidence of the use of gourds for utensils. Gourds, being nowhere wild in the New World, must have been cultivated or traded in Basket-Maker times, which suggests historic relation-

ship with Mexico, where the dipper gourd is extensively cultivated for common household use. This suggestion of southern affiliations is borne out by the greater frequency of evidences of gourd toward the south in the archaeological horizon. There is a strong typological suggestion in the early forms of the Southwest pottery ladles that they represent a carryover of the gourd dipper pattern into the new material.

While in Basket-Maker II, wild turkeys were given a minor use for food, as well as use of their feathers for elements in twisted fur fabric, no evidence of its domestication appears until later Pueblo phases. Basket-Maker II gives conclusive evidence of the Pueblo technique of true weaving. The material was wild plant fiber (apocynum), not cotton, which is of Pueblo I introduction. This early horizon yields precise data to prove that spinning was done with a cruciform stick spindle, identical with the modern Pima trait and technique. This suggests that the small, unfired, funnel-shaped artifacts found in the archaeological region may have been used for inserting between the toes for holding the butt end of the spindle--a spinning pattern strikingly different from the modern Pueblo thigh rolling of the spindle, but a pattern which is still retained by the Pimas.

In the strong emphasis on coiled basketry in Basket-Maker II is seen but the merest beginnings of twilled work, which becomes increasingly important in the later Pueblo phases, finally completely replacing coiling in Pueblo III.. Considerations of technology, typology, and frequency of twilled work in the archaeological horizon suggest derivation from Northwest Mexico where twilling is characteristic, and now the only type of basketry used. Another Mexicanism in Basket-Maker II of wide distribution in the Uto-Aztekan and Southwest ethnographic

horizon is the doubled fiber brush used in hair-dressing.

Besides pottery, Basket-Maker III has been set up as a classificatory phase of Southwest culture at the points where the simple, round, semi-subterranean slab storage cists with truncate roofs, appear to have developed slightly larger with a fireplace to prove their use as a dwelling. This generalized type of dwelling is widely distributed in the Southwest as far south as the Gila, giving the impression of a general taxonomic phase, constrained considerably however within the wider Basket-Maker II horizon.

In both the San Juan and the Little Colorado drainages Roberts' recent work has revealed a specialized Basket-Maker III house structure which appears clearly to be a historical prototype for the development of the characteristic Pueblo kiva. The Chaco village of the San Juan shows houses with an anteroom and passageway entrance. This appears as a specialization of an ancient Old World type, seen in the Plains, Eskimo, and Siberian houses as other specializations from basic form.

The Chaco dwelling shows at the entrance a slab to prevent draughts from blowing the fire--a "deflector" still seen in modern Pueblo kivas. More striking, however, is the invariable hole near the fireplace identical with the modern Pueblo kiva sipapu, the sacred place of the emergence of the ancestral clans. The suggestion that in the Basket-Maker phase this hole represented the place of the emergence of the ancestors of the household group is strengthened because the round communal ceremonial structure in the village does not have the sipapu. That the modern kiva construction of a ventilator shaft and deflector is a transference of these features from the Basket-Maker III dwelling is indicated by the lack of these features in the Chaco

village kiva. Most convincing of the development of the ventilating shaft of the modern kiva from the passageway of the Basket-Maker III domicile is the "proto-kiva house." Here the ordinary passageway had been walled in to produce a ventilator shaft and opening, in front of which the ordinary deflector stood as in modern kivas.

In the Basket-Maker III dwelling ruins of the Little Colorado river the entrance passageway had been completely displaced by the typical Pueblo kiva-like ventilator shaft. Entrance was apparently effected through a hole in the roof, since abutments for the end of the ladder are always found in the floor. The ventilator-deflector-sipapu complex is complete and with the roof entrance verifies the theories of earlier workers, like Prudden and Fewkes, that the Pueblo kiva is an elaboration on an ancient house type, conservatively retained in a ceremonial context; presumably, when clan socio-religious solidarity had transcended the household groups into clan integrations, thus necessitating a communal structure for the magico-religious rites of the larger functioning social unit. Specifically, the shift in the sipapu as a place of emergence of ancestral spirits from the dwelling to the communal house, indicates this interpretation.

The development in house type in Basket-Maker III necessitated and was dependent upon technological processes for the preparation of wood better than the scraping and sawing with chipped flakes, evidences of which are seen in Basket-Maker II. It is not surprising, therefore, that the Little Colorado Basket-Maker III yields the earliest prominence of the grooved stone ax. The three-quarter groove form has a general similarity to the Gila River Colonial Hohokam, which culminated in the

Casas Grandes culture.

Trade relationships involving the entire Post Basket-Maker phase with southern California are seen in the bracelets of Glycymeris shell, which are found as fairly common in the Little Colorado, unique as a fragment in the Chaco Basket-Maker III, but penetrating still farther north in Pueblo I to the Piedras of Colorado.

While no direct evidence of the atlatl or the bow appears in any of the Basket-Maker III sites, the presence of both large spear heads and small arrow-points indicates that the bow was probably used in Basket-Maker times, which if true would argue against the thesis of the extermination or expulsion of the Basket-Makers by Pueblo peoples armed with superior weapons.

It has been suggested that the spear in Basket-Maker III culture may have been for thrusting and not for throwing, due to the differences in these spear heads, and in the earlier dart points. The thrusting spear or lance is certainly pre-Hispanic in this general region, since accounts of it appear in the earliest historical accounts of Sonora.

Conclusions--Basket-Maker III

It has already been suggested that the classical phase of the Basket-Maker culture in the Four Corners Region represents, in part at least, the remains of Uto-Aztekan ancestral to the Hopi, and related to the nearby Shoshoneans of the Great Basin and Southern California. The Basket-Maker II technological culture seems clearly to be an elaboration and specialization of wide-spread food gathering culture, and the sophistication of the classical phase has been considered as resultant from a shift in ecological basis from food-gathering to agriculture. The increased control over the natural environment envisaged in this shift enabled a development in other aspects of technological culture due to a release of human energy and thought from mere subsistence as well as an increased population--two necessary factors in cultural advance.

Basket-Maker III is a developmental segment in an unbroken but complicated record of gradual change, shift, experimentation from within, and adaptation to introductions from without. In the history of this complex growth the ancestral Hopi are considered to have had their part in the elaboration of the typical Pueblo culture of today.

Basket-Maker III sees the secure beginnings of many of the characteristically Pueblo technological patterns. Fired, coiled pottery shows a crude form of the characteristic black-on-white decoration that extends unbroken, but improved, into much later Pueblo phases of this history. Twilled basketry, probably from the south, and twined basketry from the north have

already appeared and in the next phases slowly supplant the characteristic coiled work of the Basket-Maker culture--from which indeed it has gained its name.

The turkey had not been domesticated, but was used both for food and in providing the feathers necessary for the Basket-Maker III beginnings of the featherwork technique used in edging ornaments of the twisted fur blankets. In Pueblo II the older twisted fur was to be displaced by this new though similar technique. Basket-Maker II sees a more striking textile advance in the presence of true weaving, a sophisticated technique which never became general among the Indians of the United States. With its introduction in Basket-Maker II, the more characteristic Basket-Maker bags of twined weave died out, apparently in Basket-Maker III. There is evidence in stone work to indicate that the bow and arrow had made its appearance in Basket-Maker III times, and possibly the thrusting spear is indicated.

While the Basket-Maker III house types are still a far cry from the communal houses of the modern Pueblos, still an essential and incontestable link between them is furnished by the modern ceremonial kiva in which the roof-entrance and the ventilator-deflector-sipapu complex reveals a ceremonial conservation of the earlier dwelling of the Basket-Makers.

Thus in agriculture, pottery, twilled and twined basketry, true weaving, and the dwelling are seen in Basket-Maker culture most of the essential technological patterns on which modern Pueblo culture rests. From these Basket-Maker patterns the history of modern Pueblo culture appears to be one of inter-stimulated development with but slight direct and fundamental outside influence. The conclusion which obtrudes from such considerations is that the break in physical type in the change from

dolichocephaly to brachycephaly had but very little to do with the basic patterns of modern Pueblo culture, there being no cultural correlate to the break in physical type. It is entirely possible that immigrants mixed with the Basket-Maker population changing its physical type while taking over its culture.

From the time of Montgomery, the first writer on Basket-Maker culture, the sharp break in physical type has been the obstacle to the acceptance of the Basket-Makers as the cultural ancestors of the modern Pueblo tribes. The researches and interpretations of Kidder, Guernsey, Morris, and Roberts have closed the cultural hiatus between Basket-Maker and early Pueblo remains.

The present interpretation not only posits a genetic synthesis of Basket-Maker and Pueblo culture, but also links the marginal Uto-Aztekan "Digger" tribes of the Great Basin and southern California with some of the Basket-Maker remains, as cultural survivals. The striking similarity of "Digger" Shoshonean culture to specific Basket-Maker remains argues that the Basket-Makers represent the "proto-Uto-Aztekan" portion of the cultural sub-stratum over much of the Southwest. And out of this cultural sub-stratum has developed the culture of the Hopi, whose Uto-Aztekan speech substantiates the conclusion that Basket-Maker remains represent "proto-Uto-Aztekan" culture.

The main outlines of the development of Hopi culture from the "proto-Uto-Aztekan" portion of the Basket-Maker sub-stratum must be traced through the following general phases: Pueblo I, II, III, IV, and V.

The Pueblo Phases of Southwestern
History

Pueblo I

All the evidence now available indicates that Pueblo I was a period of cultural flux, variety, and experimentation which together with the change in physical type probably mean that this was a period not only of racial intermixture but also of change in physical characters. But with a physical change this paper is not concerned since it is restricted to cultural history. The cultural flux and variety appear as experimentation and tentative attempts to modify the pre-existent cultural patterns. Techniques such as weaving, twilled basketry, feather blanket clothing, rare in Basket-Maker times, become characteristic in Pueblo I. New and better varieties of corn are found in the archaeological remains, arguing for a higher development of the agriculture. Beans, introduced in this phase, represent an important vegetable protein addition to their diet. There is evidence in pens and droppings that the turkey was domesticated. Certainly the bow was used, although arrowheads in Basket-Maker III indicate its presence in the earlier phase. The change in pottery techniques and decoration, while showing distinct improvement, is not a sharp break from pre-existing Basket-Maker patterns. Cotton, spun in Basket-Maker phases, is woven in early Pueblo archaeology.

Most of the work in Pueblo I phase has been done in the

San Juan, where the pioneer work by Morris¹ has been followed by Jeancon,² Roberts,³ and Guernsey.⁴ The fullest account is of sites located on the Piedras at the extreme east of the San Juan.

The Piedras ruins reveal a roughly rectangular type of semi-subterranean dwelling. It is formed by a pit lined with slabs, with "jacal" walls, a flat roof with a smoke hole indicated near the center. Entrance was effected through lateral doorways. The houses are grouped around a depression (left by excavation for soil to cover the lodges). Some of the houses had interior fireplaces, while most of the cooking seems to have been done in a nearby sunken court.⁵

Kivas are not common and are aberrant from both the modern Pueblo and the ancient Basket-Maker III dwelling already described. No deflector or sipapu is present; but the roof and wall construction of "jacal" type does not differ greatly from that of Basket-Maker III, though much different from the cribbed kiva roofing seen in the "unit-houses" of Pueblo II.

The evidence of house type was preserved for the archaeologist paradoxically enough, because of burning which fired much of the clay earth. So generally were the houses burned as to strongly suggest the common Southwest custom of burning a

¹Morris: "Preliminary Account of the Antiquities of the Region Between the Mancos and the La Plata Rivers in Southeastern Colorado," 33 Ann. Rep. BAE 1919, pp. 157-205.

²Jeancon, J.A.: Archaeological Research in the North-east San Juan Basin of Colorado, 1921. State Historical and Natural History Society of Colorado and the University of Denver, Denver, 1922.

³Roberts: 1930.

⁴Guernsey: 1931.

⁵Roberts: 1930, p. 59.

house after a death. However, the whole settlement was so commonly burned that Roberts concludes as probable that warfare was responsible.¹

This type of dwelling together with a constant pottery correlate has a considerable distribution. Morris shows a considerable distribution in the La Plata and other sub-San Juan drainages.² From Beaver, Willard, and Paragonah, similar remains are reported by Judd.³ These are also suggestive of Basket-Maker III; while affiliations are apparent as far as the Muddy and Virgin valleys of Southeastern Nevada, especially in the presence of many-roomed dwellings grouped around circular court-yards.⁴ Ceramic remains aid in linking these sites into historic relationship.

The distribution of these sites to the extreme west (Nevada), north (Utah), and east (Piedras)⁵ is marginal geographically to the Pueblo region proper. This opens the suggestion that the sites so far uncovered are also culturally marginal.

¹Roberts: 1930, p. 69.

²Morris: 1919, p. 191.

³Judd: 1926, p. 8.

⁴Harrington: 1927 b, pp. 267-68.

⁵A marginal Pueblo type of structure to the south is the Colonial Hohokam. This phase seems clearly historically independent, but in it the "jacal" type of dwelling appears to have inconsiderable similarity to the Pueblo I "jacal." The historic dissimilarity is made clear by the pottery difference. In this phase of Hohokam on the Gila near Roosevelt dam the pottery decoration is much advanced and completely different, as is the pottery technique of paddle and anvil. A cross find of black-on-white pottery suggestive of Pueblo I as trade pieces in southern Arizona suggests the general contemporaneity with Pueblo I or II of the Colonial Hohokam with a much more elaborate ceramic development probably ultimately derivative from Mexico. See Haury, Roosevelt 9:6.

The house type and especially the aberrant type of kiva may mean that we are out of the main stream of Southwest history. This view is probably not acceptable to specialists in the field; but agreement is certain that more work in these aspects of the early phase of Pueblo history is urgent and immediately valuable to an understanding of Southwest history.

Pueblo II

Whatever future work may have to reveal for these early stages, one aspect of Pueblo II, the "unit-type" dwellings and kiva described by Prudden¹ in Mesa Verde appear to be an essential element in the history of Pueblo culture. This aspect of the Pueblo II phase has a distribution as far from Mesa Verde as Comb Wash in Utah. The houses have occasional short wings added at right angles, extending outward at each end.

Definite, though crude, stone-masonry wall construction appears in the houses with a single or double row of rectangular rooms. By this time in Southwestern history the masonic technique of building square corners had been mastered. Characteristically, a kiva is situated south of the dwelling, beyond which is a rubbish heap. Prudden's hypothesis that this "unit-type" is the germ of the characteristic Pueblo house construction is now generally accepted.

The Pueblo II kiva is sophisticated. It is uniformly provided with six pilasters to support the cribbed roof. It is found with a recess to the south that strongly suggests a conservation of the Basket-Maker III dwelling compartment, in front

¹Prudden: 1903-1914-1918.

of which is the deflector in the older house type (see p. 143 ff). The ceremonial survival of the older dwelling compartment as a recess in the Pueblo II kiva is borne out by the presence of the ventilating shaft under the recess in front of which the deflector is situated, just as in the Basket-Maker III dwelling, the deflector is located in or in front of the compartment wall. The Basket-Maker III fire-pit and sipapu remain unchanged in the Pueblo II "unit-house" kiva.

The relationship between the Pueblo II "unit-house" and the Basket-Maker III dwelling is strengthened by the characteristic entrance to the kiva from above. In Pueblo II, entrance to the kiva was through a covered passageway running from the kiva upward and opening into one of the adjacent rooms of the dwelling.

Evidence is not lacking of the banding together of several of these unit-houses as indicative of the process by which came about the compact pueblos of the later phases. Kidder thus reviews his own work¹ in this aspect of the Pueblo II phase² of Southwestern history:

Of larger aggregations, formed of several unit-type houses gathered together there seems to be numbers north of the San Juan.... Excavations have been carried out in a single instance, at a large ruin on Alkali Ridge, Montezuma Creek, Utah. Here the grouping together of a number of unit types is very clear, the pueblo being made up of sets of living rooms, each set having its own kivas and burian mounds. The kivas are identical with Prudden's even to the passage running back from the north recess.

By such a process of concentration of population there came about the changes in degree rather than in kind which brings on the classical phase of Pueblo history.

¹A. V. Kidder: "Explorations in S.E. Utah in 1908," American Jour. of Archeology, 2nd Ser. Vol. XIV, pp. 337-59.

²A. V. Kidder: Introduction to the Study of Southwestern Archaeology, p. 67.

Throughout the entire San Juan drainage there are abundant remains evidencing small cliff house or other communal life in small groups. From the detailed study of these much will be learned of the isolated history of these changes in house construction and material culture that brings the history to the full blown Pueblo III phase.

Two chronological techniques promise precise aid in unraveling the exact sequence. Sufficient timbers may have been preserved to enable use of the tree-ring method for more exact chronology than that based on pottery type and decoration. The pottery picture for Pueblo II is clear and incisive. It is summarized by Kidder as black-on-white with a small percentage of red.¹ Corrugated ware appears as an elaboration of the banded neck pottery of Pueblo I on the Piedras, not as a Pueblo imitation of the Basket-Maker coiled baskets, as Cushing suggested.

Pueblo III

The classical phase is represented throughout the Four Corners Region: Mesa Verde; Spruce House and Cliff Palace,² and Aztec near Farmington;³ in Chaco Canyon; Pueblo Bonito⁴ and Chetro Kettle;⁵ and in the Kayenta innumerable "proto-Kayenta"

¹Kidder: op. cit., p. 67.

²Fewkes: Antiquities of the Mesa Verde National Park.

³Morris: The Aztec Ruin, Anthropological Papers of the American Museum of Natural History, Vol. XXVI, pt. I, N.Y., 1919.

⁴Pepper: Pueblo Bonito. Judd: Archaeological Investigations at Pueblo Bonito.

⁵Hewett: "The Chaco Canyon and its Ancient Monuments." Art and Archeology, Vol. XI, Nos. 1-2, Pp. 3-28 (1921). "The Chaco Canyon in 1921." Art and Archaeology, Vol. XIV, pp. 115-131 (1922).

villages were gathering together toward the end of the period into sites like Kietsiel and Betatakin.¹ The general classical phase, dated approximately 1100-1300 A.D.,² reveals archaeological remains of a fully developed pueblo culture, the material remains of which are not inferior to any of the later phases of Southwest history.

This Kayenta aspect of the Pueblo III phase is of interest in this study because the possibility of its direct bearing on Hopi prehistory, now under serious and methodical archaeological study by survey and excavation. Strong suggestion of Hopi affiliations appear in the poor stone masonry and the square kivas, more technically termed "kihua" by Fewkes.³

In this phase the pottery has become so specialized that each region has its own characteristic forms and decorative styles that makes it clearly recognizable to the expert. The Kayenta aspect of Pueblo III is both complicated and as yet not well represented in the literature. Kidder summarizes this aspect as the basic pottery complex:⁴

In view of the apparent complexity of the archaeological conditions in the large ruins....it is a relief to turn to the pottery where types are well marked and easily distinguishable from those of any other in the entire San Juan drainage.... The pottery from Kietsiel, Betatakin and the surface Pueblos of Marsh Pass show wares that are corrugated, polychrome and black-on-white.

The corrugated is somewhat inferior to that of Chaco and Mesa Verde....

Black-on-white is characterized by fine hard paste, clear white slip and excellent of decoration....

Polychrome is very abundant.... The base color of this ware is yellow or orange, and the decoration is applied in

¹Kidder: Southwest Arch, pp. 72-3.

²Tozzer: Time and American Archaeology, pp. 210-21.

³J. W. Fewkes: "Preliminary Report on a Visit to the Navajo National Monument," Bull. 50 BAE Washington, 1911.

⁴Kidder: Introduction to Study of SW. Arch, pp. 70-1.

black, red or white.

Other aspects of the Pueblo III phase.-- Cross-finds of pottery gives some assurance for the statement that the Hohokam pueblo of Casa Grande on the Gila was in occupancy in Pueblo III times, and that the potters of the Mimbres were making their highly specialized pottery with realistically zoomorphic designs often in negative drawing.¹

In the relatively inadequate state of knowledge at present this southern culture appears much more strongly influenced by cultural impulses from Mexico. The Gila or Hohokam pottery appears as a culmination of the technological and decorative complex, still surviving with the paddle and anvil technique in much simplified form among the southern Californians, Colorado River tribes, and the Pima.²

There is a suggestion that this southern, or Hohokam, ceramic decorative development penetrated as far north as the Little Colorado in the Hopi region. There it met and enriched the Pueblo III basic complex of the Kayenta black-on-white and polychrome, to produce the striking decorative ceramics of the Little Colorado aspect of Pueblo IV, where archaeological material definitely establishes Hopi prehistory.

Little Colorado Pueblo IV

The recent studies of Hargrave and Haury³ provide certain

¹Roberts: 1929, p. 5.

²A.L.Kroeber: Native Culture of the Southwest, p. 378.

³Haury and L. L. Hargrave: Recently Dated Pueblo Ruins in Arizona, Smith. Miss. Coll. Vol. 82, No. 11, 1931.

ground in this stage of Hopi history, which by the tree-ring method they have dated circa 1300 A.D. The pottery sequence from Pueblo III (Basic Complex), Kayenta black-on-white and Kayenta polychrome is:¹

Pueblo IV Period A: Jeddito black-on-orange
Pueblo IV Period B: Jeddito black-on-yellow
Pueblo IV Period C: Sikyatki polychrome

This pottery sequence is concomitant with essential Hopi cultural elements thus summarized by Hargrave:²

Details of dwelling rooms have been found similar to those of modern Hopi Pueblos.... A knowledge of ceiling construction is found to be essentially the same as in historic Hopi structures.... Three kivas furnished data for comparison with ancestral....and modern Hopi types; thus making it possible to have the evolutionary development from 1276 A.D. to the present time.... Confirmation was obtained from stratigraphic evidence of prehistoric Hopi pottery sequence as previously determined by other means....

Thus is approached the first peak in the cultural bimodal curve of the Uto-Aztekan tribes. There survives to the present day a high aboriginal American culture that has withstood centuries of attack by Utes, Navajos, the Spanish Conquistadores, the more subtle approach of the Franciscan friars, and finally the prodigious efforts of the Bureau of Indian Affairs.

Conclusions

The conclusion that is drawn from this chapter is that Hopi history with some probability can be traced back to the Kayenta phase of San Juan Basket-Maker archaeology by the following consideration:

1. The Hopi are the Pueblo group nearest to the Kayenta

¹Haury and Hargrave, op. cit., p. 118.

²Ibid., p. 120.

phase of the Basket-Maker sites.

2. Linguistic evidence shows that the Hopi have been a Pueblo people for a very long time.

3. They preserve in their culture more Basket-Maker survivals than the other Pueblos.

4. The fundamental patterns of Pueblo culture are foreshadowed in the San Juan Basket-Maker II and the Little Colorado Basket-Maker III phases. These Pueblo patterns shown in the Basket-Maker remains include these important traits: agriculture, pottery, true weaving, and the semi-subterranean structure provided with the deflector-slab, fireplace, and sipapu.

Hopi culture substantiates the hypothesis that Basket-Maker archaeology is, in part, the remains of the earliest "proto-Uto-Aztekan" culture for which there is any record. Obviously there is no possible method to establish directly the language of the people associated with the Basket-Maker remains. In the previous chapters some degree of probability has been shown that the culture of the modern Uto-Aztekan "Digger" Indians represent a survival of the ancient Basket-Maker material as "proto-Uto-Aztekan" culture. Since the Hopi are also a Uto-Aztekan group the conclusion that they are the cultural descendants of part of the San Juan Basket-Maker culture present another link in the thesis that some sites of the Basket-Maker horizon represent the remains of "proto-Uto-Aztekan" culture.

CHAPTER V

THE SONORAN UTO-AZTEKANS OF NORTHERN MEXICO

A. INTRODUCTION

I. The Classification of Northwestern Mexican Cultural Sub-Areas

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1. Cultural Affiliations of the North Sierra Sub-area

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2. Archaeological perspective
3. Affiliations of Tepic-Culiacan with the South Sierra
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C. SUMMARY

- I. Similarity in Material Culture of the Sonoran Uto-Aztekan Expressed by statistical statements of Association
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HISTORY

CHAPTER V

THE SONORAN UTO-AZTEKANS OF NORTHERN MEXICO

INTRODUCTION

At some linguistic remove from the Shoshonean Uto-Aztekan already discussed are the Sonoran Uto-Aztekan tribes. These extend in an unbroken distribution from southern Arizona to Jalisco in west central Mexico. Of this group are as surviving tribes the Pima-Papago, the Mayo, Opata, Yaqui, the Tarahumara, Tepejuane, the Cora, Huichol, and Tepecano.¹ From the scanty linguistic work that has been done it is clear that the Sonoran Uto-Aztekan languages are more closely related to each other than to either the Shoshonean or Nahuatlan groups indicating a closer historical correlate in their culture as well. Sapir² has argued convincingly that the Mexican Uto-Aztekan represent a southward thrust down the western Cordillera of a North American linguistic group into Middle America.

Our present data present these significant problems of Sonoran Uto-Aztekan culture history. First, the possible relationship of modern tribes to "proto-Uto-Aztekan" culture.

¹The data on most of these tribes are scant and unsatisfactory and only the Tarahumara, Yaqui and Huichol cultures still remain Indian in their fundamental outlines. For the others there remains only casual and scattering historical mentions to supplement the fragmentary aboriginal culture that has survived Mexican acculturation.

²E. Sapir: "Central and North American Indian Languages," 14th Edition, Encyclopaedia Britannica.

Second, the relationships of the Sonoran Uto-Aztekan to each other. Third, their relationships to the Casa Grande and Casas Grandes archaeological remains, as well as the "Toltec" archaeological sites of La Quemada and Chalchihuites and the coastal province of Aztatlan in Sinaloa¹ farther south. Fourth, as possible bearers of the cultural exchange between the high aboriginal civilization of Middle America and the Southwest; and fifth, in their relationships with the ancient Toltecs and Aztecs.

The fragmentary data require statistical treatment of the elements of the culture. As little of the culture in this region survived the impact of the Spanish conquest, the historical sources are of especial value. The most that can be gained from these sources is a bare skeleton of the culture; that can, however, be analysed into traits suitable for statistical treatment.

The important task of working these sources has already been accomplished by R. Beals² and C. Sauer and D. Brand³ in papers invaluable for the study here attempted. The results, while fragmentary, are essential in reconstructing the picture of the aboriginal culture of the Sonoran Uto-Aztekan in Northwest Mexico before seeking historical relationships among them.

Other crucial data are given by the tribes still surviving in this region. The Pima,⁴ the Papago,⁵ the Mayo,⁶ the

¹C. Sauer and D. Brand: Aztatlan: Prehistoric Mexican Frontier on the Pacific Coast. Ibero-Americana, 1, 1932.

²Ralph Beals: The Comparative Ethnography of Northwest Mexico before 1750. 1932 Ibero-Americana, No. 2.

³C. Sauer and D. Brand: op. cit.

⁴Frank Russell: The Pima Indians.

⁵Carl Lumholtz: New Trails in Mexico.

⁶Ralph Beals: "Aboriginal Survivals in Mayo Culture."

Tepejuane,¹ and the Tepecano² are surviving remnants within this linguistic horizon. For some of these tribes ethnographic data are adequate for an analysis into traits. The Yaqui, Tarahumara,³ Cora,⁴ and Huichol⁵ survive as functioning aboriginal cultures, retaining most of their prehistoric patterns.

I. Classification of Northwest Mexican

Cultural Sub-areas

Data on these tribes is so scanty that the first problem is that of a classification of sub-areas in order to get a notion of the degree of cultural affiliation between groups of these tribes. Obviously any classification or conclusions reached for these tribes must be considered as provisional and tentative. In recognition of this, the author finds the ethnographic data justify a modification of Beals' classification.⁶ This modified classification follows in the second column.

Beals' Classification

1. Old Sonora, the old Jesuit province of that name. It extends from the middle course of the Rio Yaqui north to the Gila. It includes the	1. Pima-Papago culture in the Gila Valley and south into Sonora is separated from the Old Sonora area of Beals. The Papago are recorded as a food-gathering people
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¹Carl Lumholtz: Unknown Mexico, Vol. I, pp. 273-83.

²Ibid., Vol. II, p. 124.

³Ibid., Vol. I.

⁴K.th.Preuss, Die Nayarit Expedition, 1912.

⁵Carl Lumholtz: op. cit., Vol. II.

⁶Ralph Beals: Comparative Ethnography of Northern Mexico, Map, p. 135.

Opata and Pima.¹

in a desert environment where agriculture is casual at most. The culture of the agricultural Pima still retains the outlines of a simple food-gathering technology.

The validity of this separation is indicated by the statistical statement of its divergence from the Sonoran-Sinaloa Mayo-Opata-Yaqui.

2. Old Sinaloa extends from the Rio Sinaloa to the Rio Yaqui, confined largely to the coastal Plain. Most of the province was occupied by closely related branches of the Cahita-(Yaqui) speaking peoples.²

2. In place of Beals' two groups Old Sonora and Old Sinaloa, this classification results in a Sonora-Sinaloa group for the ethnographic Mayo-Yaqui-Opata, agriculturalists.

3. The northern Sierra³ is occupied by the Tarahumara. Their terrain is practically coterminous with the southwest third of Chihuahua.

3. The same. The Tarahumaras occupy the high Sierra. Their terrain is practically coterminous with the southwest third of Chihuahua.

4. The Southern Sierra includes tentatively the territory of the Tepecano, Huichol, Cora, possibly the agricultural Zacateco, Tepejuane, and the Acaxee.⁴ It extends from Durango to Tepic.

4. The Southern Sierra appears as a valid sub-area; although there appears to be a steady shift in its culture from north to south. This appears as a gradual modification from Tarahumara simplicity to Huichol ceremonial elaboration.

5. Tepic-Culiacan Province. Most of the modern states of Jalisco, Tepic and two-thirds of the coastal plain of Sinaloa fall into one province, which is distinctly sub-Mexican in character. The culture of the northern and southern parts....show certain differences that may

5. Part of Beals' Old Sinaloa is placed in the Jalisco-Tepic area as affiliated more distinctly with sub-Mexican or "Toltec" culture than with the modern ethnographic Sonoran culture, which appears much simpler and more like Tarahumara culture.

Beals notes a distinct cultural break in the Mexican State of

¹Beals: op. cit., p. 139.

²Ibid., p. 136.

³Ibid., p. 139.

⁴Ibid.

justify dividing it into two separate areas.

This has been done....the northern part being called the Tepic-Culiacan province.¹

Sinaloa. He finds that there is a distinct drop in culture between Old Sinaloa and the Culiacan region to the south.²

Sauer and Brand have published on this southern Sinaloa area. They, too, meet this sharp line of cultural demarcation at the Cahita (Yaqui). "In the Sinaloa Valley the conquerors encountered the southernmost members of the great Cahita group and described them clearly."³

Beals' Culiacan-Tepic province stands unmodified, with the recognition of the sharp demarcation between the Cahita peoples belonging to the Sonora-Sinaloa group of the present author, and the "Aztatlan" of southern Sinaloa. This area contrasts sharply with the others in its sub-Mexican or "Toltec" affinities.

6. Jalisco-Tepic province is the southern part of the region of southern Sinaloa, Tepic and Jalisco.⁴

6. This province is unmodified though the cultural data on this region are still inadequate to establish it. However, Jalisco and Tepic are in the Nahuatlan area; whereas Culiacan-Tepic appears to have been Sonoran in linguistic affiliations.

II. The Relation of "Sonoran" Uto-Aztekan

To "Proto-Uto-Aztekan" Culture

The hypothesis argued in the preceding chapters is that the culture of the Southwest developed from a Basket-Maker sub-

¹Beals: op. cit., pp. 136-7.

²Ibid., p. 145.

³C. Sauer and D. Brand: op. cit., p. 56.

⁴Beals: op. cit., pp. 136-37.

stratum, part of which was "proto-Uto-Aztekan." From this the development of Hopi culture was traced. Is there any evidence that the culture of the Sonoran Uto-Aztekan derives from variants of the same sub-stratum?

On the assumption of a southern movement of the Uto-Aztekan peoples, traces of the survival of this ancient culture should be sought in the northern segment of Sonoran Uto-Aztekan distribution. In southern Chihuahua the author found an ancient variant of Basket-Maker archaeology, which is interpreted as the cultural sub-stratum from which Tarahumara culture was erected (see p. 211). Were knowledge of northwestern Mexico archaeology as complete as that of the Southwest, some conclusive substantiation might be available for the hypothesis here tentatively suggested that variants of "proto-Uto-Aztekan" Basket-Maker culture were brought into northwest Mexico by the ancestors of the Sonoran-Nahuatlán tribes.

In the extreme northern limits of the Sonoran Uto-Aztekan, the Pima-Papago tribes have a culture still affiliated with that of the ancient Basket-Makers in the following traits: dependence on desert food, coiled basketry, the rabbit-fur blanket, the men's clout, the cruciform spindle, and paint-bags tied with a thong, the fire drill and hearth, sandals, caps, skin clothing, and shaman's crystals. Even these few common traits open a significant problem. Are the Pima-Papago survivors of "Proto-Uto-Aztekan" culture, rather than Casas Grandes and the archaeological Hohokam?

HISTORY AND AFFILIATIONS OF
CULTURAL SUB-AREAS

I. The Pima-Papago Sub-area

1. Cultural history of the Pima-Papago

a. Introduction: Casas Grandes and the Hohokam (Casa Grande)
archaeological phases

Instead of remains of a simple "proto-Uto-Aztekan" culture, in the northern sector of the Sonoran Uto-Aztekan distribution are found archaeological remains in every way as elaborated as that of the Pueblos and with much more evidence of Mexican affiliations.

Very little is known about the culture of Casas Grandes in northern Chihuahua. Lumholtz investigated the Cliff Houses¹ in the mountains of the region which Carey interprets as related to the principal ruins, which were called Casas Grandes² by the early Spaniards. The wall construction of the principal site is very thick, of puddled blocks of adobe cast in place, much as cement is poured in a frame. It was a massive building standing to three stories in historic times. The rooms are large and rectangular and are grouped as to form a great central structure with lower buildings around it.³ Dr. A. V. Kidder has studied the

¹Carl Lumholtz: Unknown Mexico, Vol. I, pp. 10-100.

²Henry A. Carey: "An Analysis of NW. Chihuahua Culture," A.A. 33:3, pp. 325-74.

³Kidder: Introduction to...S.W. Archaeology, p. 115.

pottery and finds that its basic patterns are Southwestern,¹ although it had assimilated a number of Mexican traits.

On the Gila River near Tucson, Arizona, is a similar ruin with a similar name, Casa Grande. This appears to have been the culmination of a culture growth local to the Gila region and has been termed Hohokam. An early developmental phase has been described under the term Colonial Hohokam.² This is characterized by shallow pit houses of "jacal" type strongly suggestive of Pueblo I in the San Juan. However, in both pottery technique and decoration the Colonial phase appears surprisingly well developed. Cross finds of crude black-on-white from the San Juan suggest possible contemporaneity of Colonial Hohokam, and Pueblo I which is emphasized by the similarity in house types.³ (P.163,n.5)

There is a possibility that the Southwest sub-area of the Mimbres culture characterized by pit-houses and the best of Southwestern pottery may be an off-shoot from this Colonial Hohokam.

The principal and highest developed site of Casa Grande resembles Casas Grandes of Chihuahua, both having the same technique of wall construction and a similar ground plan except that Casas Grandes has a surrounding wall. Cross finds of pottery indicate that both these "Big House" sites are contemporaneous, a suggestion that is emphasized by the fact that both structures are dominated by a tall central structure that is interpreted as a temple or fort. In Casa Grande some of the houses were congre-

¹Kidder: The Pottery of the Casas Grandes District, Chihuahua. Holmes Anniversary Volume, pp. 253-68. Wash., 1916.

²E. W. Haury: "Roosevelt, 9:6, A Hohokam Site of the Colonial Period," The Medallion. Gila Pueblo Globe Ariz., 1932.

³E. W. Haury: op. cit., p. 130.

gated on low pyramidal sub-structures which appear specifically as Mexican.¹

Hohokam pottery is quite distinct from that of Casas Grandes and is even more differentiated from Pueblo pottery in decorative design, coloration, and in manufacture by the anvil and hammer technique. This technique seems ultimately derivative from Sonora with an offshoot in the crude pottery used in the lower Colorado and by the southern Californians (see p. 168).

On geographic and other considerations the evidence appears conclusive that in this southern segment of the Southwest is a local cultural development largely independent of Pueblo growth, but no doubt indirectly much stimulated by it. Also there is seen a much greater degree of southern influences, ultimately derivative from Middle America. This influence is seen in such features as:

1. Adobe construction.
2. Low pyramidal mounds supporting other structures.
3. Temple-like central structure.
4. Legged metate.
5. Negative pottery painting.
6. Representations of the plumed serpent.
7. Pottery decoration by incising, gouging and scraping.
8. Plastic effigy design as decorative ceramic elements.

Since there are no similar archaeological remains to the south nearer than Zacatecas, these aboriginal Mexicanisms can be adequately accounted for only by reason of the numerous and long continued prehistoric trade contacts between the Southwest and Mexico. As early as Pueblo III macaw skeletons appear as far north as Pueblo Bonito in the San Juan. A lively trade of Southwest turquoise for Mexican parrots and macaws and their feathers followed the prehistoric trade route along the western coast of

¹J. W. Fewkes: Casa Grande, Arizona. 28th Ann. Rep't. B.A.E., p. 97.

Mexico which was followed by the Spanish explorers and conquerors of the Southwest.¹ This route passed Casa Grande, which strongly suggests that the Mexican influence seen in Hohokam culture was resultant from this intercourse.

b. The Pima-Papago Relationships to the Archaeological Hohokam and the Basket-Maker Cultures

Pima and Papago are mutually intelligible dialects of the Sonoran branch of the Uto-Aztekan languages. The Pima dialect is spoken by an agricultural tribe of the lower Gila Valley in Arizona; in the region of the archaeological ruin of Casa Grande. The Papago range extensively in the desert to the south and east through Arizona and Sonora,² in the general area of Casas Grandes.

The implication that the Pimas are descendants of the carriers of Casa Grande culture is apparent in the archaeological designation of this phase as Hohokam. This is a common Sonoran Uto-Aztekan word for "people" by which the Pima-Papagos, and the Tepejuane call themselves--"o-o-tam";³ while the Tepecanos call themselves "hu-ma-kam."⁴

The hypothesis that the Pima-Papago culture is a descendant in degenerated form of the Casas Grandes culture, is the simplest explanation of the fate of this Hohokam culture. Dr.

¹C. Sauer: The Road to Cibola, Ibero-Americana; 3, Berkeley, 1932.

²C. Lumholtz: New Trails in Mexico, p. 23.

³Ibid.

⁴A. Hrdlicka: "The Region of the Ancient Chichimecans," p. 402.

J. W. Fewkes,¹ who excavated at Casa Grande, concludes with such an interpretation and gives the Pima folk-lore for its historical value in such a hypothesis. He reviews Bandelier, whose historical scholarship provides the strongest support of this interpretation. Bandelier² quotes Ribas³ account of 1645 that the Pima Baja of Sonora (Nébones) "had solid houses of large adobe, and each village had a larger edifice, stronger and provided with loop-holes which served in case of attack as a place of refuge." Even so general a description is suggestive of Casa Grande ruin and causes Bandelier to draw this conclusion of Pima history:⁴

....their organization and their arts all bear testimony to the truth (of their legends) of the sad tale of a powerful sedentary tribe reduced to distress and decadence in architecture long before the advent of the Spaniards.

Bandelier could not know much about the arts of Casa Grande, since it had not been systematically excavated. Indeed Fewkes, later digging here, shows very few resemblances with Pima-Papago arts.

The data available are not yet sufficient completely to invalidate Bandelier's conclusion; but the account of Sonoran fortifications which he quotes is not a description of another Casa Grande. A proof of his thesis lies in the archaeology of Pimeria Baja, the region of the Nébones. The proof is not forth-

¹J. W. Fewkes: "Casa Grande, Arizona," Ann. Rep. B.A.E. No. 28, pp. 153-55.

²A. Bandelier: Final Report, Investigations Among Indians of the Southwest, Papers Archaeological Institute of America, Amer. Ser. IV, 1892.

³Fr. P. Andres de Ribas: Historia de los Triunfos etc., p. 360.

⁴A. Bandelier: Final Report, Investigations Among Indians of the Southwest, Pt. II. Papers Archaeological Institute of America. Amer. Series IV, Cambridge, 1892. P. 81.

coming from Lumholtz' account of Sonoran archaeology,¹ revealing Cliff Houses which Carey relates to Casas Grandes, Chihuahua,² since they are very different from the communal adobe ruin of Casa Grande.

The simple hypothesis that the Pima-Papago culture is a descendant of Casa Grande culture does dismiss the puzzling problem: Whence disappeared the living culture once sheltered by this great ruin? But it appears inadequate at many points:

1. Why among the Pima-Papago is the agriculture of corn so poorly integrated, with no ceremonial or mythological references?

2. Why the striking differences in building construction?

3. Why in Pima-Papago culture are there no evidences of the excellent technology of stone for utilitarian and ceremonial objects seen in the Hohokam?

4. Why the crudity of modern Pima-Papago pottery and decoration in view of the Mexican character of Hohokam pottery with its tripod and ceramic effigy forms?

5. Where is the excellent carving in shell?

6. Why does Pima-Papago culture show no trace of the elaborate ceremonial complex evidenced in the ancient phase by stone idols in shapes of human beings, the frog and the mountain-sheep of Pueblo affiliations, as well as the coiled serpent of Mexican type?

7. Where in Pima-Papago culture is there any evidence of political or religious institutions that brought forth the

¹Carl Lumholtz: Unknown Mexico, Vol. I.

²Henry Carey: "An Analysis of Northwest Chihuahua Culture," Amer. Anth., Vol. 33, No. 3, pp. 325-74.

communal labor which erected the adobe fortress or temple represented by the ruin of Casa Grande?

It must be granted that cultures do degenerate leaving very few traces among the people of the former cultural elaboration. From internal evidence alone it would be difficult to say that the present-day inhabitants of Xochimilco once participated in Aztec civilization, or that the Maya Indians of Central America are descendants of the builders of the high culture evidenced in the Maya archaeological remains.

Data exist on the disappearance of useful arts, but the hypothesis of Pima-Papago survival from Casa Grande culture needs a demonstration that the art of agriculture would be given up in a region favorable for its exercise, in favor of a difficult subsistence to be gained from wild plants in an arid desert. Fewkes argues that the salinity of Gila river water may account for this disappearance of agriculture.¹ Alkali is a problem in the Southwest, but Russell shows that the Pima irrigated their fields principally to wash out these depositions, and never have abandoned a field because of them.²

All the evidence indicates that agriculture was neither old nor well integrated in the culture of the Pima-Papago. The Papago (4,500, of whom 700 were in Mexico in Lumholtz's time)³ are mostly non-agricultural food-gatherers in one of the most meager of American desert environments. Mesquite beans, other desert seeds and roots, as well as the fruit of the cactus and sahuaro are their staple foods. Meager as is this source of

¹J. W. Fewkes: op. cit., p. 160.

²Frank Russell: The Pima Indians, p. 86.

³Lumholtz: op. cit., p. 23.

food, the Papago produce from the desert sufficient goods to trade with the Pima for corn, etc.¹

The Pimas now use the Gila Valley for irrigated agriculture, and under modern education have become Americanized Presbyterian farmers. They live on some of the best agricultural land in Arizona with their rights and privileges guaranteed by a paternalistic government in appreciation of the services of the earlier Pimas to American pioneers and later as the scouts of the Apache campaigns.

The Pima have proved very amenable to this recent influence and are excellent farmers. Nevertheless, it seems clear from Russell's account of thirty years ago that corn was a less elaborated complex than wheat, from which were made tortillas, bread, etc., while corn was merely parched. The parching technique is the ancient "proto-Uto-Aztekan" method of blowing coals mixed with the grain, though the Pimas substitute for the ancient basket a more practical wooden or pottery parching-pan.²

All that is known of introduced plants argues that wheat could not have dislanted a well integrated corn complex in the period since the Spanish conquest. It has not done so in the Pueblo culture with which Casa Grande is comparable. Even among the simpler Tarahumara, corn is the food par excellence, while wheat is a catch-crop appreciated only in times of famine.

A second line of evidence indicates that corn was never well knit into the culture of the Pima-Papago. Their ceremonial and mythology contains only a few and very casual references to corn. It would be expected, had corn ever been developed among

¹Frank Russell: op. cit., p. 93.

²Ibid., p. 68, Pl. XIX a.

them sufficiently to have supported the population of Casa Grande, that some traces of its former importance would be reflected in the ceremony and mythology.

A third line of evidence is suggested against importance of corn in Pima-Papago culture. This is offered by the prominence of the use of wild plants for food by both the Papago and the Pima. Russell's account reveals a surprising lore among the Pima dealing with the ecological resources of desert plants. This emphasis, together with the slight importance of corn, indicates that maize was never a well integrated complex, because it is hardly probable that a well developed corn culture would be given up in favor of a meager existence to be eeked from the wild plants of the desert.

Certainly the Pima-Papago stand off sharply from the Pueblos in technological, as well as social and religious culture, representing about the lowest culture among the agricultural Indians of the Southwest. It seems clear that Pueblo culture has developed from a simple food-gathering cultural substratum. It hardly seems plausible that in the same region under the same general conditions this process was reversed among the Pima-Papago, causing them to degenerate from a culture comparable to the Pueblo, to a food-gathering Basket-Maker culture.

Suggestions of "Proto-Uto-Aztekan" survivals among the Pima-Papago.--- Rather than the cultural survivors of the high Casa Grande culture, the Pima-Papago show vestiges of the food-gathering coiled basketry cultural sub-stratum that has been termed "proto-Uto-Aztekan." A considerable lore of desert ecology exists among the Pima, who still in Russell's time could subsist on the desert when the waters of the Gila river

failed.¹ The Papagos were almost solely a desert food-gathering tribe. Another ancient survival in Pima-Papago culture is the mortar-pestle which was never completely displaced by the metate-mano in the techniques of food preparation resultant from the introduction of corn.

Among the Pima-Papago, neither the Mexican basketry technique of twilled work, nor the anvil-paddle technique of pottery could displant coiled basketry² which, like the Athabaskan Navajo and Apache, may derive from the ancient much wider distribution of this technological principle, given archaeological perspective in the classical Basket-Maker to the north and Rio Fuerte Basket-Maker in the nearby Tarahumara country to the south (see p. 211).

Another specific Basket-Maker survival in Pima-Papago technology is the rabbit-fur blanket, still to be seen in Russell's time.³ The men's clout has its archaeological prototype in the Basket-Maker horizon.⁴ In the technological complex for clothing, the striking similarity of the Piman cruciform spindle and that of Basket-Maker III has been pointed out. Buckskin tanning with deer brains was still remembered in Russell's time,⁵ and a use of buckskin reminiscent of the classical Basket-Maker is seen among the Pima⁶ in the paint bags tied with a

¹Frank Russell: op. cit., p. 66.

²Ibid., p. 99.

³Ibid., pp. 157-58.

⁴Hough: Early Pueblo Ruins in the Upper Gila, p. 83, and Kidder and Guernsey: Explorations in NE. Arizona, 1919, p. 157.

⁵Russell: op. cit., pp. 117-18.

⁶Ibid., p. 160.

thong.¹ Buckskin shirts and moccasins may have been a Plains introduction through the Apache, though skin clothing has a wide early historical distribution in North Mexico.²

The comparison of Pima-Papago culture with both the archaeological Hohokam and the Basket-Maker remains leads to the conclusion that the facts are best accounted for by the hypothesis that this modern Sonoran Uto-Aztekan culture is not a degenerated survival of the sophisticated Hohokam archaeology. Among the Pima-Papago the lack of a well integrated corn-complex, the dependence on desert food-gathering, the unique Sonoran use of coiled basketry, and the presence of the Basket-Maker III cruciform spindle suggests rather that these modern tribes have maintained some of the patterns of "proto-Uto-Aztekan" culture. The hypothesis that this culture was brought into northern Mexico by the proto-Sonoran Uto-Aztekan is substantiated by the archaeological Basket-Maker phase in the Tarahumara region of Chihuahua to the south.

¹Kidder and Guernsey: op. cit., p. 189, Fig. 85, Pl. 86g; 1921, p. 99, Pl. 44.

²Ralph Beals: op. cit., p. 173.

Analysis of the Material Culture of the
Sonoran Uto-Aztekan Tribes

There follows a tabular analysis of the material culture of the Sonoran Uto-Aztekan tribes. It is inadequate, but is as complete as a strict use of the data will permit. Traits marked with an "x" are present in the different sub-areas as evidenced by reference to ethnographic literature. In many cases the presence of a trait is practically certain on general principles, as for instance the dog, but our data does not reveal it for citation. So strict a use of the data is apt to be misleading, but should be less so than the use of hypothetical fact even if based on practical certainty.

In the table "Pr" is once used to signify probable and is counted. Recent Spanish-Mexicanisms have been omitted from the table since this reconstruction of Uto-Aztekan history is mostly concerned with pre-Hispanic problems. The "batea" is probably such a Mexicanism but its invariable use with the metate to catch the meal after grinding carries a suggestion of antiquity.

ANALYSIS OF MATERIAL CULTURE

SONORAN UTO AZTEKAN-TRIBES

	Pima-Papago Sub-Area			Sonora-Sinaloa Sub-Area			North Sierra Sub-Area	South Sierra Sub-Area			Tepic-Culiacan Sub-Area		
	Fima	Papago	Total	Opata	Mayo	Yaqui	Total	Tarahumara	Tepe juane	Cora	Huichol	Tepecano	Total
CULTURE TRAITS													
DWELLINGS													
Mat House													X
Ancient adobe house				X	X	X	X	X	X	X	X	X	X
Stone house				X	X	X	X	X	X	X	X	X	X
Multiple storey house				X	X	X	X		X	X	X	X	
Thatched roof								X	X	X	X	X	X
Square house "jacal"		X	X	X	X	X	X	X				X	X
Mud wattle house				X	X	X	X	Pr	X	X	X	X	X
Dwelling caves								X				X	X
Round house	X	X	X	X			X	X	X	X	X	X	X
Arbor	X	X	X	X	X	X	X						
Menstrual hut	X		X										
Ceremonial brush circle	X		X										
Log singing house									X			X	
God house										X		X	
Temples										X		X	X
STORAGE STRUCTURES													
Circular basketry bins	X	X	X										
Globular basket	X	X	X										
Hewn board structures								X	X			X	
Archae. stone crypt								X					
Corn drying structures								X					

ANALYSIS OF MATERIAL CULTURE

GONORAN UTO-AZTEKAN TRIBES

(Continued)

	Pima-Papago Sub-Area			Sonora-Sinaloa Sub-Area				North Sierra Sub-Area	South Sierra Sub-Area				Tepic-Culiacan Sub-Area
	Pima	Papago	Total	Opata	Mayo	Ysqui	Total	Tarahumara	Tepe juane	Cora	Huichol	Tepecano	Total
Round stone structure								x		x		x	
Palisades													x
Cane fences					x	x	x						
Community house	x	x		x			x		x	x	x	x	
Loop-holes in houses		x	x					x			x	x	
Flat roofs				x	x	x	x	x					
Stair-ways										x	x	x	
HOUSEHOLD APPUR-TENANCES													
Twill mats	x	x	x	x	x	x	x	x	x	x	x	x	
Goat-skin								x					
Metate and mano	x	x	x	x	x	x	x	x	x	x	x	x	
Water gourds	x	x	x		x		x	x		x	x		x
Dipper gourds					x		x	x	x	x		x	
Pottery cooking jars	x	x	x	x	x	x	x	x					
Pottery bowls								x					
Wooden spoons	x	x	x		x		x	x					
Wooden bateas	x	x	x		x		x	x					
Carrying baby-board	x	x	x			x	x						
Female conical carrying frame	x	x	x					x					
Carrying yoke					x	x	x						x
Breast-strap								x		x	x		x
Mortar	x	x	x			x	x						
Markets													x
Towns													x
Barrios													x
FOOD													
Pinole	x	x	x	x	x	x	x	x	x	x	x	x	
Atole	x	x	x		x		x	x					
Tortillas					x		x	x				x	x
Tamales					x		x	x					
Esquiate								x					

ANALYSIS OF MATERIAL CULTURE

SONORAN UTO-AZTEKAN TRIBES

(Continued)

	Pima-Papago Sub-Area			Sonora-Sinaloa Sub-Area				North Sierra Sub-Area	South Sierra Sub-Area				Tepic-Culican Sub-Area
	Pima	Papago	Total	Opata	Mayo	Yacui	Total	Tarahumara	Tepejuane	Cora	Huichol	Tepecano	Total
Succotash								X					
Boiled beans	X	X	X	X	X	X	X	X				X	X
Boiled squash	X	X	X	X	X	X	X	X				X	X
Greens				X	X		X	X					
Stews				X	X		X	X					
Tuna fruit	X	X	X	X			X	X				X	X
Pitaya	X	X	X		X		X	X				X	X
Oak leaves eaten								X					
Ash leaves								X					
Green corn								X	X	X	X	X	X
Agave utilized				X	X	X	X	X	X	X	X	X	X
Palms food				X	X	X	X						
Chile sauce									X			X	X
DRINK													
Tesquino				X			X	X	X	X		X	
Pitaya wine	X	X	X	X			X						
Wild grape wine				X			X						
Corn stalk tesquino								X					
Agave tesquino								X					
Distilled mescal										X		X	
Pulque													X
NARCOTICS													
Tobacco	?	?	?	?	?			X			X	X	
Datura				X			X	X					
Peyote				X			X	X	X	X	X	X	
CHEWING GUM	X	X	X										
IMPLEMENTS													
Digging stick	X	X	X					X		X	X	X	
Sword-shaped hoe	X	X	X	X	X		X	X		X	X	X	
Earth oven	X	X	X		X		X	X	X	X	X	X	X
Bird-cage	X	X											
Fire-drill and hearth	X	X						X					

ANALYSIS OF MATERIAL CULTURE

SONORAN UTO-AZTEKAN TRIBES

(Continued)

	Pima-Papago Sub-Area			Sonora-Sinaloa Sub-Area			North Sierra Sub-Area	South Sierra Sub-Area			Tepic-Culican Sub-Area
	Pima	Papago	Total	Opata	Mayo	Yaqui	Tarahumara	Tepejuane	Cora	Huichol	Tepecano
Sahuaro hook	x	x									
Willow tweezers	x	x	x								
"Tree animals"	x	x	x								
Doubled fiber brush	x	x	x						x		x
Willow head-ring	x	x	x								
DOMESTIC ANIMALS											
The dog	x	x	x				x				
The turkey				x	x	x	x				x
Bees											x
Ducks											x
CLOTHING											
Breach-clout	x	x	x		x	x	x				
Kilts or skirts	x	x	x				x		x		x
Blankets	x	x	x	x	x	x	x				
Tilmas				x		x	x				
Pouches									x	x	x
Girdles	x	x	x				x		x		x
Ribbons							x		x		x
Moccasins	x	x	x								
Sandals	x	x	x				x		x	x	x
Skin-clothing	x	x	x	x		x	x		x		x
Rabbit-skin blankets	x	x		x	x	x					
Skin caps		x	x	x	x	x	x				
Painted clothing				x	x	x					
Cotton mantas											
Cotton camisas											
Feather capes											
PERSONAL ORNAMENTS											
Feather head-dress											
Turquois				x	x	x					
Abalone							x				
Face painting	x	x	x				x		x		x
Tattooing	x	x	x	x	x	x					

ANALYSIS OF MATERIAL CULTURE

SONORAN UTO-AZTEKAN TRIBES

(Continued)

	Pima-Papago Sub-Area	Sonora-Sinaloa Sub-Area	North Sierra Sub-Area	South Sierra Sub-Area	Tepic-Culican Sub-Area
	Pima Papago Total	Copala Mayo Yaqui Total	Tarahumara	Tepejuane Cora Huichol Tepecano Total	Total
Ear-piercing	x x	x x	x		
Nose piercing	x x	x x			
Men's hair in skeins	x x				
Women's hair loose	x x				
Plastering hair with mud	x x x				
Hair nets				x x	
HUNTING AND WAR					
Sinew-back bow	x x x	x x			
Self-bow	x x	x x	x	x x	x
Fore-shafted arrow	x x x	x x	x	x x	x
Wrist-guard		x x		x	x
Arrow-poisoning		x x	x		x
Spear or lance	x x	x x x	x x	x x	x x
Atlatl			x		x
Clubs	x x	x x x	x x	x x	x x
Slings	x x	x x x	x x	x x	x x
String "Fig. 4" trap			x		
Running down deer	x x		x		
Insects and reptiles eaten			x		
Log box trap			x		
Cutting down trees for squirrels			x		
Circular gopher trap			x		
Animal-skin quiver	x x		x		
Alligator-skin leather					x x
Tapir-skin leather					x
Organized warfare		x x x x			
War dance with head		x x x x	x		
Preserving skulls		x x	x		
Head-taking		x x	x	x	x
Feather head-dress	x x				

	Pima-Papago Sub-Area	Sonora-Sinaloa Sub-Area	North Sierra Sub-Area	South Sierra Sub-Area	Tepic-Culican Sub-Area
	Pima Papago Total	Opata Mayo Yaqui Total	Tarahumara	Tepejuane Cora Huichol Tepecano Total	Total
Scalping	x x x	x			
Scalp-pole dance		x			
Shields	x x x	x x x			x
Obsidian sword	x x				x
Cotton armour					x
FISHING					
Blanket-nets			x		
Enclosure traps			x		x
Fish-poison		x	x		
Fish eaten	x x x	x x x	x	x	x
Shooting fish	x x	x x x	x		
SALT-MAKING					x
WEAVING					
4 post horizontal loom	x x x	x x	x		
Cotton woven	x x	x x x		x x	x
Agave woven	x x	x x	x		x
Fiber removed after cooking	x x				
Gourd or wood whorl			x		
Pottery spindle whorl					x
False "girdle-back" loom			x	x x	
Selvage threads	x x				
Woof used as selvage			x		
Indigo cultivated		x x	x		
Urine fixing		x x	x		
Coil without foundation netting	x x x				
Rope-twister	x x		x	x x	
Embroidery decoration				x x	

ANALYSIS OF MATERIAL CULTURE

SONORAN UTO-AZTEKAN TRIBES

(Continued)

	Pima-Papago Sub-Area	Sonora-Sinaloa Sub-Area	North Sierra Sub-Area	South Sierra Sub-Area	Tepic-Culiacan Sub-Area
	Pima Papago Total	Opata Mayo Yaqui Total	Tarahumara	Tepehuane Cora Huichol Tepecano Total	Total
BASKETRY					
Multiple foundation coil	x x x				
Coiled trays	x x				
Bowls	x x				
Wood basketry awls	x x				
Oval seive	x x				
Twilled technique "Yaqui" medicine basket	x x x		x x	x x	
Double twill basket			x x		
Single twill basket	x x x	x x x	x		
Straining basket for tesquino			x		
POTTERY					
Paddle-anvil technique	x x x				
Coiled			x		
Red ochre slip	x x		x		
Gourd smoother			x		
Decoration after firing	x x		x		
AGRICULTURE					
Zea maize cultivated		x x x x	x		x
Beans cultivated		x x x x	x		
Squash cultivated		x x x x	x		
Agave cultivated		x x x x			x
Chile cultivated					x
Guava					x
Irrigation	x x				x
Ciruelas					x
Zapotes					x
Milpa agriculture					x

ANALYSIS OF MATERIAL CULTURE

SONORAN UTO-AZTEKAN TRIBES

(Continued)

	Pima-Papago Sub-Area			Sonora-Sinaloa Sub-Area			North Sierra Sub-Area	South Sierra Sub-Area			Tepic-Culican Sub-Area			
	Pima	Papago	Total	Opata	Mayo	Yaqui	Total	Tarahumara	Tepejuane	Cora	Huichol	Tepecano	Total	Total
Sweet potato cultivated														X
Aguacate														X
Cacao														X
Chia cultivated								X			X	X		X
GAMES														
Football kicking race	X	X	X	X	X	X	X	X						
Woman's racing game								X						
Woman's hockey game	X	X	X											
Sham battles		X	X											
"Vaputta"	X		X											
Stick dice	X		X											
Patolli	X	X	X	X	X	X	X	X						X
Relay races	X		X											
Guessing cache game	X		X											
Ring and pin game	X		X											
Pelota				X	X	X	X							X
Intervillage games				X	X	X	X	X						
TRAVEL AND TRANSPORTATION														
Balsas		?		X										
Rafts of calabash														X
Litter														X
PILGRIMAGES														
Salt		X	X											
Peyote								X			X	X		

ANALYSIS OF MATERIAL CULTURE

SONORAN UTO-AZTEKAN TRIBES

(Continued)

	Pima-Papago Sub-Area			Sonora-Sinaloa Sub-Area				North Sierra Sub-Area	South Sierra Sub-Area				Tepic-Culican Sub-Area
	Pima	Papago	Total	Coata	Mayo	Yaqui	Total	Tarahumara	Tepejuane	Cora	Huichol	Tepecano	Total
JEWELS													
Pearls													x
MUSICAL INSTRUMENTS													
Musical bow					x		x	?	x	x	x	x	x
Flute	x	x		x			x	x					
Basket drum	x	x											
Rasping stick	x	x		x			x	x			x		x
Gourd rattle	x	x		x			x	x					
Disc rattle	x	x		x			x						
Belt rattles	x	x						x					
Cacoon rattles	x	x		x	x	x	x	x			x		x
Hoof rattles	x	x		x			x	x					
Double-headed drum				x			x	x					
Gourd drum in water					x		x						
Atabale													x
Teponastly											x		x
METALS													
Gold										x			x
Silver										x			x
Copper										x			x
CEREMONIAL ARTIFACTS													
Feather and string fetish	x	x											
Feathered shaman sticks	x	x											
Shaman's effigies	x	x											
Masks	x	x			x	x	x	x					x
Shaman's wand	x	x						x			x		x
Shaman's crystals	x	x						x		x	x		x
Sucking tubes	x	x						x					

	Pima- Papago Sub-Area	Sonora- Sinaloa Sub-Area	North Sierra Sub-Area	South Sierra Sub-Area	Tepic- Culican Sub-Area
	Pima Papago Total	Opata Mayo Yaqui Total	Tarahumara	Tepejuane Cora Hulchul Tepecano Total	Total
Prayer sticks	x x	x x x x			
Ceremonial use tobacco	x x		x	x x x x	
"God eyes"			x	x x x x x	
Votive gourd bowl				x x x x	
Parrot feathers				x x	
Altars			x	x x x x	x
Temple chairs				x x	
God's chairs				x x	
Reed banner				x x	
Animal effigy cakes				x x	
Bamboo serpents				x x	
Idol (grandmother growth)				x x	
Stuffed armadillo				x x	
Ceremonial arrows				x x x	
Discs of tufa				x x	
Macaw feathers				x x	
Tobacco gourd				x x	
Symbolic shields				x x	
Symbolic mats				x x	
Rock head-effigy				x x	
Snakes kept				x x	
Feather hat ornaments			x	x x	
Stuffed squirrels				x x	
Incense			x	x x x	x
Carved stone idols	x x		x	x x x x	
Peyote priests			x	x x x x	
Food offering			x	x x x x	
Captive eagles	x x x	x x x x		x x x x	
Ceremonial drinking	x x x	x x	x	x x x	x
Dancing patio			x		
Cedar smoke			x		
Idol fetish		x x x x	x		x
Ceremonial fire			x		x
Burial house burned	x x				

ANALYSIS OF MATERIAL CULTURE

SONORAN UTO-AZTEKAN TRIBES

(Continued)

	Pima-Papago Sub-Area			Sonora-Sinaloa Sub-Area			North Sierra Sub-Area	South Sierra Sub-Area			Tepic-Culican Sub-Area	
	Pima	Papago	Total	Opata	Mayo	Yaqui	Tarahumara	Tapejuane	Cora	Huichol	Tepecano	Total
Subterranean crypt		x	x				x					
Cave burial												
Cremation												x
Human sacrifice												x
Rattle snake idols												?
Ceremonial trees												?
Tribal totals	105	65	170	62	70	66		31	35	73	29	
Sub-Area totals			119			102	136				98	77

The Cultural Affiliations of

Pima-Papago

a. The Relations between the Pima and Papago

Analysis yields a total of 105 traits for the technology of the Pima and 65 for the Papago. For the latter there are reported these 14 traits independent of the Pima:

1. Prayer sticks
2. Salt pilgrimage
3. Sham battles
4. Caps
5. Running down deer
6. Scalp and pole dance
7. Use of Agave fiber
8. Balsas ?
9. Subterranean burial crypt
10. Coiled basketry bowls
11. Loopholes in houses
12. Square houses
13. Self bow
14. Keeper of the Smoke

Thus the traits shared by the two tribes are 52, and dividing this by the 105 traits of the Pima gives 50% of Pima traits shared by the Papago. Of the 65 Papago traits, 52 are shared by the Pima. Hence, 79% of the Papago material culture is also Pima.

The conclusion obviously is that while the Papagos are essential Piman, the Pimas through a situation more favorable both for borrowing and through a better control of a richer environment have relatively greatly elaborated their material culture and technology. This conclusion is a reasonably safe one, since the linguistic similarity is so close that the Pima-Papago are essentially the same people. Hence, the principal variables which obtrude result from natural environment and situation for

borrowing.

b. The Yuman Affiliations of Pima-Papago Culture

It is natural from the situation between Mexico and the Southwest that Pima-Papago culture should not have so conservatively retained as many ancient Basket-Maker traits as appear in southern California and the Great Basin. As the rear guard of the Sonoran Uto-Aztekan peoples, the Pima situated in the lower Gila show strongest the impress of the lower Colorado River cultures. Kroeber¹ gives an analysis of the cultural resemblances of the Gila Pima and the Colorado River Yuman tribes, which reveals 22 shared traits among the 119 traits resulting from the present author's tabulation of Pima-Papago material culture (see table, p. 190 ff.). Of these shared traits (roughly 19%), the following 13 traits (11%) have penetrated Sonoran Uto-Aztekan culture only among the Pima-Papago:

1. The ladder type carrying cradle
2. The mortar (also shared by the Yaqui)
3. The ring and pin game
4. Basketry drum
5. Flood irrigation
6. Willow head-ring
7. Nose piercing (shared by the Yaqui)
8. Men's hair dressed in "skeins"
9. Women's hair loose, cut in front
10. Women's hair treated with mud and mesquite-gum
11. Paddle and anvil pottery
12. Basketry granaries
13. Circular brush ceremonial structure

c. The Sonora-Sinaloa Affiliations of the Pima-Papago

The degree of relationship between the Pima-Papago culture and the Colorado River Yumans has been expressed by the

¹Kroeber: The Seri, 1931, pp. 44-45.

figure 11%. A much higher degree of similarity would be expected between the Pima-Papago and the Uto-Aztekan of Sonora and Sinaloa. The historic province of Pimeria Baja was in these Mexican States, and remnants of Pima peoples still remain here to suggest a common genetic linguistic and cultural heritage from this region.

The Pima-Papago yield 119 traits (a) and the Sonora-Sinaloa 102 (b), while the number of traits in common is 60 (c). Following Driver and Kroeber's¹ simple proportionate expression P to state the degree of similarity between these two cultures, produces the formula: $P = \frac{c}{a} = \frac{60}{119} = .50$. Thus the traits common between Sonoran-Sinaloa and the Pima-Papago form 50% of Pima-Papago material culture. Obviously the Sonoran-Sinaloa affiliations greatly outweigh those of the Colorado River Yumans in Pima-Papago culture.

Another aspect of the similarity of these two Uto-Aztekan cultures is expressed by the proportionate equation:

$$P = \frac{c}{b} = \frac{60}{102} = .59. \text{ The common traits are 59\% of Sonora-Sinaloa}$$

culture. From either of these approximations it would seem that the Pima-Papago culture is quite sharply distinguished from the

¹Driver and Kroeber: "Quantitative Expressions of Cultural Relationships," U.C.P.A.A.E., 1932. This paper gives an excellent review of the previous attempts that have been made to use statistical techniques in the analysis of cultural problems. The degree of similarity between traits of cultures a and b is expressed by the following equations of proportion P, involving the common traits, c:

$$P = \frac{c}{a}; \quad P_1 = \frac{c}{b}.$$

As a single expression, the arithmetic mean of the proportions (A) = $\frac{P + P_1}{2}$; and the geometric mean (G) = $\frac{c}{\sqrt{ab}}$. Another expression, which avoids the difficulty of counting the common traits twice, is gained by this equation:

$$T = \frac{c}{a + b - c}.$$

Sonoran-Sinaloan. The amount of change that each has undergone, despite a common origin and general geographic propinquity and continuity, can thus be expressed approximately.

To get a single value to express objectively the degree of similarity between these two cultures, the simplest method is to calculate the arithmetic mean (A) for the two proportions, which for this case is 55%. The geometric mean (G) from the equation $G = \frac{c}{\sqrt{ab}}$ follows this value closely as 52%.¹ Another coefficient for the single expression of the degree of similarity between such variables results from the equation $T = \frac{c}{a + b - c}$ or $\frac{60}{119 + 102 - 60} = .37$. This figure is appreciably different from the means A and G of the proportions.

¹The difficulty in using a mean as a single expression of the similarity between two variables is twofold. It counts the common traits twice and is not sensitive to wide variations in the two variables. However, Driver and Kroeber find in ranking all the expressions that G has a slight advantage in regularity over A and T, but cannot say whether it is an accident from the set of figures from Clements Polynesian data, or is the truer measure (see p. 244). Logically the geometric mean is more sensitive to wide variations in the variables than is the arithmetic mean, because as they become more divergent the product of the variables is less constant than the square of the mean.

The value T escapes the difficulty of counting the common traits twice, but is not sensitive to divergencies in the variables a and b. Theoretically both G and T are preferable to A as a single expression of association or degree of similarity as Driver and Kroeber find from a practical test of all these measures.

II. The Sonoran-Sinaloan Sub-area

The Cultural Affiliations of Sonoran-Sinaloan Technology

Relationships with the Tarahumara.--- Among the 42 Sonoran-Sinaloan traits not appearing in Pima-Papago technology, most are seen to involve more developed architectural, agricultural, and industrial techniques which link Sonora-Sinaloa more closely with the Tarahumara. The Sonora-Sinaloa flat roofs, adobe house, and stone house types are traits not found among the Pima-Papago as architectural developments with Tarahumara affiliations. Non-Pima agricultural and food techniques such as tortillas and tamales, stewed meats and domestication of the turkey, and the manufacture of corn tesguino, are Sonora-Sinaloa traits specifically related to the agricultural Tarahumaras rather than to the semi-desert Pima-Papago. Industrial developments beyond Pima technology but of Tarahumara affiliations are: the cultivation of indigo for a textile dye, urine fixing, fish-and-arrow poisoning, and double twilled basketry. A ceremonial context is given to the following non-Pima traits by both the present or historic Tarahumaras and the Sonoran-Sinaloans: the musical bow, Datura and peyote, head-taking, preserving skulls, dance with the head, and idol fetishes. A common social trait is intervillage games. Thus the Sonoran-Sinaloans and the Tarahumaras appear to have participated more fully in the technological elaborations which were missed by the Pima-Papago. These developments appear to have originated in Mexican cultural impulses rather than Southwestern.

The use of palms for food and the game of pelota with a rubber ball are Sonoran-Sinaloan traits of south Mexican derivation. The mud wattle house, organized warfare, painted clothing, and the prayer stick or arrow are traits apparently related to the Southwest proper as well as southern Mexico. But as to the borrowing from without and the drift from within Sonoran-Sinaloan culture which have produced these changes from aboriginal "proto-Sonoran" Uto-Aztekan culture, nothing can be determined.

A detailed statistical comparison of Sonoran-Sinaloan culture with that of the Tarahumaras will be later shown to give a similarity of only 50%. Still Ribas,¹ valuable summary of aboriginal Sonoran-Sinaloan culture will hold for the essential patterns of Tarahumara culture as the Spaniards must have found it.² There is a different emphasis on some things; for instance, cave dwelling is characteristic of Tarahumara culture but thatched "jacals" now used in the gorges may well be an old Sonoran Pattern. The weapons, the bow, arrows, wrist-guard, lance, and quiver are identical. The war complex is gone so completely from Tarahumara culture that only Spanish documents attest to Tarahumara participation to a considerable extent in the war complex portrayed by Ribas. Tarahumara dress still retains evidence of its meager Sonora-Sinaloa patterns. Face painting and the women's use of ear-pendants are still practiced by the Tarahumara.

Drinking, "the most common vice of Sonora-Sinaloa," is

¹Fr. Padre Perez de Ribas: Historia de los Triunfos de Nuestra Santa Fe entre Gentiles mas Barbaros. Mexico, 1645, p.5-18.

²This impression of aboriginal Tarahumara culture is derived from archaeological and documentary evidence as well as many identical survivals.

the essential element in most of Tarahumara social, economic, and religious culture. The tobacco "vice" functions in Tarahumara ceremony as in Sonora-Sinaloa except there is no evidence of the reed censer.

Corn, beans, squash, tuna, pitahaya, mescal cooked in the earth oven for a sweet and a drink, are identical patterns in both sub-areas. The ancient Sonoran pinole of mesquite beans is made from corn among the Tarahumara to provide the staple food. Communal hunting is not practiced by the Tarahumara today, nor are animal pelts used for anything but an occasional arrow quiver.

Patolli and "correr el palo," the football kicking race, are characteristic Tarahumara amusements. The carrying yoke is not found, and archaeological evidence indicates that the mecapal carrying strap is old in the North Sierra.

Tarahumara shamanism corresponds point for point with that of Sonora-Sinaloa. But witchcraft ceremonies no longer appear. They may have died out because now every Tarahumara is considered a possible doer of black magic by "thinking bad" against his neighbor. Only very slight evidence of more specific magical beliefs or practices remain.

Tarahumara marriage may never have been celebrated with the solemnity described for Sonora-Sinaloa. Parental arrangements are not unknown among the Tarahumara, but are not now characteristic. No berdaches were seen.

The same lack of political organization is apparent in Tarahumara culture. Since the Spanish missionaries stopped warfare, they succeeded in giving the Tarahumaras a community integration exercised by a chief, "saligame" (T). The center of the Tarahumara community is a Catholic church to which all

Tarahumaras within walking distance (15 miles) belong and where they congregate every Sunday for prayers by a native "maestro" and a harangue by the chief. These harangues are specifically related to the "sermones" that interested the priest-ethnographer Rivas.

Thus most of the essential patterns of the culture in the two sub-areas are the same. It will be seen that many differences in minor detail have come about which serve to differentiate the regions sufficiently to justify their classification as distinct sub-areas.

III. The North Sierra Sub-area (Tarahumara)

1. Cultural Affiliations of the North Sierra Sub-area

a. The Sonora-Sinaloa Affiliations of the Tarahumara.¹

The statistical correlation of the Sonora-Sinaloa and Tarahumara cultures, while high, shows that distinct cultural sub-areas are involved. Analysis of Tarahumara technology gives 136 traits (a), the Sonora-Sinaloa 102 (b), the common traits are 60 (c).

The extent of common traits in Tarahumara culture is proportionately stated by $P = \frac{c}{a} = \frac{60}{136} = .44$. The proportionate expression

for the common traits in Sonoran-Sinaloan culture is 59%. The arithmetical mean being 51%, the geometric mean 50.5%. The other

¹R. L. Beals: Comparative Ethnology of Northern Mexico Before 1750, p. 134, sets up as one of the culture provinces in northern Mexico a North Sierra province comprised of the Tarahumaras. This is entirely valid in view of what we now know. I use the term Tarahumara as synonymous with this area since I am dealing with the Uto-Aztekan as tribal units.

single value of the degree of similarity between these two cultures T, being 34%. These values are almost identical to those expressing the relationship between Sonoran-Sinaloan and Pima-Papago, indicating that these three Uto-Aztekan cultures have drifted apart about equally.

b. The Pima-Papago affiliations of the Tarahumara.--

The degree of similarity between Tarahumara material culture (a), and that of the Pima-Papago (b), may be stated proportionately in view of the 58 common traits. $P = \frac{c}{a} = \frac{58}{136} = 43\%$. Quantitatively practically the same degree of similarity in Tarahumara is seen toward Pima-Papago as to Sonora-Sinaloa. By the equation $P = \frac{c}{b} = \frac{58}{119} = 49\%$, a slightly higher proportion of common

Tarahumara traits in Pima-Papago appears, indicating that Pima-Papago has diverged less from a common basic culture. For a single expression of the degree of similarity $A = 46\%$; $G = 47\%$.

$T = \frac{c}{a + b - c} = 29\%$. These values are slightly but distinctly lower for the Pima-Papago affiliations of Tarahumara than for the Sonora-Sinaloa affiliations, which agree with the author's general impression that the last two groups are more closely related.

Stated quantitatively, these co-efficients overlook the important technological and industrial sophistication in which Tarahumara more closely resembles Sonora-Sinaloa than Pima-Papago. In contrast to the qualitative similarities discussed under the "Cultural affiliations of Sonoran-Sinaloan Technology," the common Pima-Tarahumara traits mostly involve a simple basic cultural sub-stratum:

1. Loopholes in houses (Found in Tarahumara archaeology)
2. Women's carrying frame (Related to SW Basket-Maker carrying basket ?)
3. Pinole (A wild seed technique for food preparation)

4. The digging stick (Basket-Maker)
5. Fire drill-and-hearth (Basket-Maker)
6. Men's clout (Basket-Maker)
7. Sandals (Basket-Maker)
8. Caps (Basket-Maker)
9. Skin clothing (Basket-Maker)
10. Slings
11. Running down deer
12. Animal-skin quiver
13. Shooting fish
14. Shaman's crystals (Basket-Maker)
15. Tobacco ceremonially used
16. Stone idols
17. The belt rattle

Besides these old basic traits, a few appear as aboriginal traits resulting from post-historic diffusion, at least into Tarahumara culture.

1. The wool girdle
2. The rope-twister
3. Red ochre slip pottery decoration
4. Decoration after firing

In conclusion, Sonora-Sinaloa, Tarahumara, and Pima-Papago show proportionate similarities between 40 and 60 per cent, giving reason to think that quantitatively the north Mexican Uto-Aztekan cultures have drifted apart about equally from each other. Tarahumara material culture shows a slightly greater proportion of similarity with Sonora-Sinaloa than with Pima-Papago. But qualitatively the traits common to the Sonoran-Sinaloan and Tarahumara sub-areas involve architectural, agricultural, and industrial developments not seen in the Pima-Papago. The Tarahumara affiliations with the latter are apparently of a simple, more basic cultural sub-stratum showing a high correspondence with Basket-Maker archaeology.

2. Cultural History of the Northern Sub-Area

a. A variant of "proto-Uto-Aztekan" culture: Rio

Fuerte Basket-Maker remains.--- The hypothesis that the history

of the modern culture of the Sonoran Uto-Aztekan represents divergent drifts from a "proto-Uto-Aztekan" culture is substantiated by the archaeological material from the region of the head-waters of the Rio Fuerte in southern Chihuahua. This material has a correspondence with the Basket-Maker variants of the Southwest seen in the following traits:

1. Presence of corn and the absence of beans
2. Absence of pottery
3. Burial in flexed position in cave cists
4. Blankets of rabbit-fur and turkey-feathers
5. Absence of dwellings or hearths
6. Antler punches and bone awls
7. The string apron skirt
8. Coiled basketry
9. Circular slab structure

Our first archaeological material from the Tarahumara country is of a Basket-Maker cultural phase. Corn was present, but beans and squash missing. No evidence of the cultivated gourd appears. In burials, corn ears placed near the mouth give some indication that corn was eaten from the cob, roasted.

In the Basket-Maker horizon bodies were buried in flexed position in cists in caves. In the Tarahumara country the body was wrapped in a twilled mat over a fur or feather blanket and finally, next to the body an agave-fiber woven blanket as standard funerary equipment. Besides offerings of food, the "telescope" type of elongated twilled basket with a cover was placed with the body to contain personal implements and possibly fetishes buried with the dead. This type of twilled basket has survived as a special ceremonial basket in later phases of Tarahumara archaeology, and is still found in such a context among the Pima and the Yaqui. From one grave came a reed paint tube, a unique Tarahumara trait, still used for decorating the feather shafts of arrows. The paint tube was also found in the Cave Dweller phase; this connects its ancient and modern occurrence.

Abundant evidence of fire in the burial caves strongly suggests the funerary fire still kindled by the pagan Tarahumaras.

Large bowl-like containers 24 inches in diameter and 8 inches deep were made by coiling rolls of grass imbedded in mud as a binder. The coiling technique is reminiscent of pottery but cannot be identified with the classical Basket-Maker attempts at unfired coiled pottery with vegetable temper. Rather this Chihuahua container seems to be a simplification of the coiled mud and grass storage structures of the Cliff Houses of the Casas Grandes archaeological phase of northern Chihuahua. This in turn Lumholtz related to the Tlaxcalan granaries. This carries the suggestion that the Rio Fuerte Basket-Maker structures in the Tarahumara country were used for the cave storage of food. Much more definite is the evidence that some of these grass-mud containers were given a funerary context. One was found to have been deliberately placed in the top of a burial cist while the heavy mud covering was soft. In this and another site the containers were found to hold nothing but a few seeds of the poisonous wild "bean" which may have ceremonial significance.

Just as throughout the Basket-Maker horizon, no evidence of any dwelling structures appears in the Tarahumara phase. Since natural caves are still used by the Tarahumara for housing, it seems probable that such shelter served their ancestors.

More is known of the mortuary culture of this ancient people than of their daily living. It is known, however, from archaeological finds that coiled basketry had not been completely superseded by the twilled work of the later archaeology, and modern Tarahumara usage. Obsidian was worked into crude flakes with sharp cutting edges. Caches of obsidian nodules indicate the high value attached this material, which is rare in the Sierra

and may have been brought from considerable distance. Antler punches, presumably for working obsidian, and bone awls, probably for working coiled basketry, were found.

For clothing, twined robes of turkey feather material were made by twisting the feathers around a base cord of agave fiber. Rabbit fur cord was found only in fragments. Excellent weaving of blankets of agave fiber is shown by the frequent remains found. No evidences of the loom arrangement appeared. An isolated fired clay spindle whorl of Middle American type suggests trade, but not necessarily at this ancient level. The women probably wore a string apron public skirt, since one was found on the "mummy" of a female child. No evidence of men's costume remains except blankets. No evidence of sandals was found, though they may be expected since rumors of them were common in conversation with vandals who have looted many of these ancient caves. Simple personal decoration in necklaces of black seeds was all that was found or need be expected in so simple a culture. Abalone does not appear until a later phase of Tarahumara history. A hair-net strikingly similar to those of California suggests an ancient pattern for the more sophisticated one still worn by the Huichols.

Knowledge of the household and personal appurtenances is scanty. No metates were found or indicated, but round rubbing stones were well worked. Coiled basketry is a diagnostic trait in this culture. Since no pottery was found coiled basketry may have furnished most of the utensils as is the case throughout much of the wide archaeological and ethnographic Basket-Maker horizons. The coiled basketry was not charred to suggest tumbling corn or seeds with live coals, which again may indicate that corn was roasted on the cob. The hearth and drill method of

fire making is suggested by the finding of these remains, unfortunately disturbed. No evidence of either the atlatl or the bow and arrow appeared in the two sites excavated.

Two small ollas with red-ochre slip and wavy line decorations in black were found unfortunately disturbed by vandals. These stand off so sharply from the pottery of the region, both ancient and modern, as to strongly suggest contact at some period of the use of the cave, with Casas Grandes, the pottery of which it rather closely resembles. Similarly disturbed were two stool-like boards with legs about an inch long at each of the four corners. These are of unknown affiliations, but stand off sharply from all known culture of the Tarahumara region. No stone axes or mauls appeared and evidences of wood culture were scant, except for partially burned fire-wood and logs. In one of the sites a breast strap or tump-line, excellently twill-woven of yucca leaves, convincingly suggests an ancient prototype for the modern leather makapal, or carrying device, used by the Tarahumaras and other north Mexican tribes.

In the second site the diagnostic coiled basketry and fur and feather blankets have dropped out, but relationships are certain since the burial cists and coiled mud-grass containers are similar. Here appeared the first semblance of a large storage structure, resembling in a general way the classical Basket-Maker storage structures found in Kane County, Utah. The Chihuahuahua variant was a circle of upright slabs about 6 feet in diameter, held in place without adobe plaster by the sand of the cave floor. No hearth or evidence of habitation appeared. A few sherds of crude, fired pottery in this second site adds to the evidence that it is culturally intermediate between the Basket-Maker and the Cave Dweller phases of Tarahumara history. In

the sand at the base of this structure was found the burial of a child in a blanket of agave thread, spun almost as fine as modern cotton cloth. In this burial was a gourd container which was ornamented with painted "cloisonné," a technique believed to be related to the pottery ornamentation of the archaeology of Chalchinhuites. In this container seeds of the squash appear for the first time in the archaeological record.

b. The Cave Dweller phase.-- The Cave Dweller phase yields considerable archaeological evidence from 47 sites of the development of Tarahumara material culture from these simple beginnings to its present outlines. The conclusion that this phase is prehistoric Tarahumara material is established by the numerous archaeological traits and techniques still seen in Tarahumara culture:

1. Evidence of funerary fire (also Rio Fuerte Basket-Maker)
2. Reed paint tubes (also Rio Fuerte Basket-Maker)
3. Twilled basketry (also Rio Fuerte Basket-Maker)
4. Loop-holes in houses
5. Corn storage structures built in cave niches
6. Round corn storage structures still seen in the gorges
7. Burial in walled cave niches without provision of a door (still characteristically practiced by the pagan Tarahumara)
8. Burial with gourd dippers for pinole.
9. Presence of pottery cooking pots and eating bowls
10. Metates
11. Shed-sticks and spindal whorls of Tarahumara pattern
12. Bows and fore-shafted arrows
13. Planting sticks
14. Shaman's sucking tubes of reed
15. Twilled mats
16. Double twilled baskets, with and without covers

The presence of wool in funeral blankets serves to distinguish between the prehistoric and post-Hispanic divisions of Tarahumara history.

The following Rio Fuerte Basket-Maker traits are lacking in the Cave Dweller phase:

1. Coiled basketry
2. The string apron skirt
3. Fur and feather blankets
4. The subterranean burial crypt
5. The grass-mud container

The Cave Dweller phase is further distinguished from the Basket-Maker by the presence of walled storage structures of stone in med plaster and of round houses of the same material. Both structures protected niches in many of the numerous caves available in the region.

The type of cave house of this phase has been completely given up by the modern Tarahumaras. The ancient dwelling structure is round, 8 or 10 feet in diameter, of roughly and irregularly coursed masonry held by mud plaster. The walls were built so far out of plumb as invariably to have fallen at the lateral entryway. This entrance was evidenced in some cases by a low mud jamb. The houses were unroofed or utilized a niche in the cave so low as to provide a roof from the natural top of the cave. The floor of the cave dwelling was invariably plastered with a smooth layer of adobe mud, many times several inches in thickness, which no doubt served to insulate the occupants of the house from the rapid change of the temperature of the rock cave floor during the cool sierra nights. In one dwelling two loop holes, 4 inches in diameter, remained near the fallen doorway, at heights suitable for use in defense of the house. These may have served either for protection or ventilation. One storehouse was found so provided which suggests the function of ventilation for which purpose loop-holes are still seen among the modern Tarahumara, though rarely. Loop-holes in houses are also reported for the Pima and the Huichol.

In two of the houses depressions in the center of the room rather inconclusively indicated the presence of firepits.

Other houses showed a projecting mud foundation or base about 3 inches high of such size and shape as to make it probable that they supported the metate.

The modern Tarahumaras occasionally use storage structures of the ancient type. In the same caves, near the dwellings, smaller niches were walled up, either with straight or rounding walls to produce a storage house. Entrance was gained to this structure by a square opening about 12 by 18 inches, provided with stone or wooden lintels. The opening was closed by a flat stone chipped roughly to fit the aperture. It was plastered into the opening with adobe mud.

The ground-plans of these store-houses were of sizes and shapes determined by the natural niches, which were thus walled up. Occasionally in the Sierra, old storage structures were seen like those which have survived among the Tarahumaras of the gorges. These are round structures of rough masonry as much as 4 feet in diameter and 6 feet high. They were provided with a roof of long slabs of stone, or in one house roofed with saplings apparently cut with a stone ax.

No archaeological evidence indicated a mastery of the structural principle of building square corners in masonry. One post-Hispanic site of considerable antiquity was found in which a rectangular floor plan had been achieved by using upright logs at the corners. This technique for achieving a square corner is still used by the Tarahumaras who have not yet mastered the mason's principle of the square corner, except in areas of strong Mexican influence where the Jesuit priests teach masonry to their neophytes.

Commonly the corn storage structures found secondary use for burial. But commonly burials were made in special structures

not provided with a door. These structures were of slabs leaned together and supporting a roof of similar material, the whole rudely but securely held together with heavy mud plaster. Few had survived without having been opened by vandals. Both the corn storage houses and the Cave Dweller burial structure reveal surprising similarity to structures described and illustrated from the classical Kayenta region of northern Arizona.¹ No more specific historical relationship can be posited for this similarity than slightly divergent evolution from a similar Basket-Maker basic culture.

Most of the knowledge of the ancient culture comes from both the storehouses and the burial structures. All of the dwellings were found empty, cleaned both by the wind and passing Tarahumaras, who feel no compunction toward the dead after the burial feasts are completed.

The material of the Cave Dweller phase presents the essential patterns for modern Tarahumara foods with clear evidence that corn was ground on the metate in the preparation of pinole which was drunk from gourds. The Cave-Dweller phase yielded beans supplementing the corn and squash of the intermediate phase to complete the staple Tarahumara corn-bean-squash complex. While little domestic culture remained other than metates, still prehistoric antiquity for the custom of grinding corn into pinole is established by a cache of that food with one of the burials. The dipper gourd was commonly buried with the dead as among the modern Tarahumaras, to enable the spirit to partake of pinole on the journey to the land of the future life.

The dipper gourd was found more commonly than pottery,

¹See footnote 3, page 139.

and was more elaborated than in modern Tarahumara culture. Not only were dipper gourds found in the Cave Dweller phase decorated with inlay "cloisonné," as has been seen in the intermediate phase; but also hemispherical tree gourds were beautifully decorated with green, blue and white painting. The painting technique was common and possibly related to Mexican lacquer work on gourds. These decorated tree gourds stand out so sharply from Tarahumara decoration, both ancient and modern, that they well may have been trade pieces, although the tree gourd does grow in the gorges.

The custom of burying the personal kit with the dead, gives us some data on ancient cultural activities. With the burials of women commonly were shed-sticks for weaving, as well as numerous stick spindles with circular or squarish whorls of wood, like those still used. Burials of men produced long bows of mulberry wood and tri-feathered reed arrows with a fore-shaft. One fore-shaft was still provided with a tiny obsidian point attached to the shaft with sinew wrapping. Sharpened planting sticks about 3 feet long of general Southwest type attest the ancient technique of cultivation of corn, beans, and the squash. By the Tarahumaras it is still used in the cultivation of upland bean-fields. Oxen and the plow have superseded the digging stick for corn and squash.

One burial was recognized by a Tarahumara as the grave of a shaman, because of the presence of the characteristic reed sucking-tubes with which most of their cures are effected.

Excellent twilled mats of "under three over three" and "under two over two" were commonly found wrapping the bodies, and were presumably used as "petate" sleeping mats. Excellent round baskets of the same technique, woven double, were more common than the single twilled weave that has now almost displaced

the double woven baskets in Tarahumara culture. "Under one over one" plain checker-work was seen in mats, but not commonly. This technique has disappeared completely.

The blankets continue to be of agave thread, while fur and feather cloth completely disappear from the textile patterns in the Cave Dweller phase. Black wool first appears in the blankets as decorative bands and margins, displacing the vegetable fiber. A common style no longer seen in wool blankets is alternate transverse bands of white and black wool about half an inch in width. Hair ribbons of that material and in the same style were found only in the burials of wool. These were about an inch in width. The decorative elements now woven in Tarahumara blankets were not found with any evidence of antiquity, and are therefore considered rather recent in Tarahumara culture. In simple combinations, the Tarahumara decorative elements are often the same as in the more ornate decorative patterns of the Navajo. This suggestion is not conclusive since there is a world-wide similarity in many simple decorative motifs, but the wide-spread similarity in wool girdles suggests that the introduction of wool may have stimulated north Mexican and South-western textile working and made possible a strong stylistic interchange that swept throughout the entire region.

The coming of the Spaniards revolutionized Tarahumara technology by introducing the steel ax which shifted the emphasis in the available resources for construction from stone and mud to the timber plentiful in the Sierra. No less did domestic animals reorientate their technology in providing manure for fertilization of the fields, beasts of burden for transportation and plowing, and wool for blankets and girdles to displace vegetable fiber. The acceptance of European fruit trees yields the

modern Tarahumaras fruit for trade with the Mexicans which is exchanged for cotton cloth, violin strings, knives, axes, mouth-organs and the few other commodities of industrial economics. By abstracting from Tarahumara technology and production the ramified results of these three introductions, there is revealed an aboriginal technology much of which can be traced back through archaeology to a simple Basket-Maker phase of a widespread and ancient culture horizon.

IV. The Southern Sierra Sub-Area

Beals' Classification¹ of the Tepecano, Huichol, Cora, and possibly the agricultural Zacateco, Tepejuane, and Acaxee as South Sierra is still necessary in view of the limited knowledge of this culture. His classification is apparently valid in the light of the ethnographic knowledge that has accumulated since the time of the sources that he compiled.

The Acaxee were a group of tribes now extinct who adjoined the Tarahumaras to the south and west.² The culture is completely gone, but isolated historical references to it indicate a southern extension of Tarahumara culture. The Zacatecos, part of whom were without agriculture, inhabited the present State of Zacatecas and portions of Durango, especially the drainage of the Nazas River.³ They were the northernmost tribe referred to

¹Ralph L. Beals: The Comparative Ethnology of Northern Mexico Before 1750, Ibero-Americana 2, 1932, p. 139.

²C. Thomas and J. R. Swanton: Indian Languages of Mexico and Central America, pp. 19-20.

³Ibid., p. 40.

in the Spanish sources as Chichimecos, which gives them an historical interest augmented by the proximity of the great ruins of La Quemada and Chalchihuites.

1. "Toltec" Archaeology and the Southern Uto-Aztekan

The striking ruin of La Quemada is located on the sides and top of a high hill, near the capital, Zacatecas. It was first visited for systematic description in 1830 by Joseph Burkart¹ and Carl de Berghes.² Photographs from Batres³ show rough but solid masonry of laminated stone with but little if any remains of stucco or plaster. Much of the ruin suggests structures for fortifications as well as temples and habitations. The architectural features of its ground plan reveal: exposed pyramidal temple bases, both truncated and set-back; a ball-court; a room of columns; paved avenues; patios; and a large boulder with pecked pictographs of rattlesnakes realistically executed. The general affiliations of this ruin with the "Toltec" architecture of the Valley of Mexico is apparent. Whether it has a relationship with the "Toltec" of Sinaloa cannot be said, since the survey upon which that latter rests does not include data on architecture.⁴ The minor culture of La Quemada is but little known. The pottery, figurines, and elbow effigy pipes may have relationships both with the Valley of Mexico and Sinaloa.

In the vicinity of Chalchihuites, Zacatecas, Manuel Gamio⁵

¹Joseph Burkhart: Aufenthalt und Reisen in Mexico. Stuttgart, 1826, 2 vols.

²Carl de Berghes: Beschreibung der Ueberreste Aztekischer Niederlassungen auf ihrer Wanderung nach dem Thale von Mexico, 1855. Original manuscript in the Ayre Collection, Newberry Library. Valuable for Berghes' sketches and maps.

³L. Batres: Visita a los Monumentos Arquelologicos de la Quemada Zacatecas, Mexico, 1903.

⁴C. Sauer and D. Brand: Aztatlan: Prehistoric Mexican Frontier, 1932.

⁵M. Gamio: Los Monumentos Arquelologicos de las imediasiones de Chalchihuites, Zacatecas. Anales del Museo Nacional TomoII, 1910.

partially excavated ruins related to La Quemada. He found evidences of fortifications prominent not only in turreted forts but in caves as well. The ruin of Alta Vista revealed a room of columns, and apartments with stairways. The masonry had apparently been covered with mud reinforced with fiber of cacti overlaid with a thin layer of clay and lime.

Pottery was of two kinds: a lead-glazed yellow or red ware with black decoration, and an incrustated or cloisonné decorated ware. In cloisonné ware depressed decorations of human figures, animals, fruits, flowers, and geometrical designs were filled with colored clay which, when fired, produced various and vivid colors, green, red, blue, and white.¹ This incrustated or cloisonné technique of pottery decoration is a ceramic sophistication not before met with. In its affiliations are suggested with the "Toltec" of Sinaloa² to the west, as well as Jalisco³ and the Valley of Mexico. Isolated trade pieces in this technique entered the Southwest Pueblo area by Pueblo III, two fragments having been found in Pueblo Bonito of the Chaco sub-area of the San Juan drainage.⁴

Another element of the minor Chalchihuites culture has possibilities of wide cultural ramifications. This is a mosaic ornament on a fired clay foundation incrustated with worked tur-

¹M. Gamio: op. cit., p. 486, Lamina 60.

²C. Sauer and D. Brand: op. cit., p. 33.

³Carl Lumholtz: Unknown Mexico, Vol. II, p. 460, Pl.

XIII.

⁴George Pepper: Pueblo Bonito, Anth. Pap. Amer. Mus. Nat. Hist., Vol. XVII, 1920, pp. 51-52. Pepper reports cloisonné work on sandstone.... Designs in black, red, yellow, and white, while the basic color was black which had been allowed to dry, after which the designs were formed by cutting out such portions of the pigment as were to be filled with other colors.

quoise, steatite, and beryl.¹ The design showed stylistic similarities to the treatment of the human figures found by Lumholtz² in Jalisco and another found by Hrdlicka.³ Incrusted mosaics in turquoise, shell, or other material are apparently Mexicanisms that reached the Southwest in Pueblo II or III phases⁴ and are found throughout the archaeological horizon.

¹M. Gamio: op. cit., p. 492.

²Lumholtz: op. cit., Vol. II, p. 460, Pl. XIII.

³A. Hrdlicka: "The Region of the Ancient Chichimecs," Fig. 39.

⁴S. J. Guernsey: Explorations in Northeastern Arizona, 1931, p. 103, Pl. 1.

The two sites of La Quemada and Chalchihuites have strong suggestion of Toltec affiliations. In their isolated situation in the Sierra about midway between the Valley of Mexico and the American Southwest they should prove of unusual significance for an understanding of the historical contacts between these two regions. This is recognized by Gamio, who finds Chalchihuites related to La Quemada, both constituting the northern limit of architecture characterized by stairways, columns, and turret fortifications, all of which show affiliations with Central, South, and Southeast Mexico while other features clearly show the influence of the pueblos of the Southwest.¹ The recent demarcation of a Toltec province on the Pacific Coast to the west suggests possibly more direct affiliation.

The only ethnographic correlate with this archaeological material found in present culture of the region is the inlay decoration in the lacquer-ware gourds toward the south. A simplified form of this technique has also been noted in the gourds of the prehistoric Tarahumara archaeology. The author agrees with Gamio that the Zacatecas and Tepejuane Indians now in the region were not the builders of these advanced cultural remains.² The isolated situation of these striking ruins with such strong affinities led the early Spaniards like Torquemada to note them as remains of the Aztec migration from the mythical seven caves of the North, a theory elaborated by many other authors. But the evidence, in our present inadequate knowledge, of fortifications suggests the possibility that these isolated Toltec sites are the remains of a colony from the south or west which finally

¹M. Gamio: op. cit., p. 492.

²Ibid., p. 473.

succumbed to the attacks of the warlike Zacateco and Tepejuane tribes of the vicinity. The slight knowledge of the peoples surrounding these ancient ruins does not solve any of the problems that they present. Archaeological excavation must solve these problems.

2. The Surviving Cultures in the South Sub-Province

Of the great Tepejuane nation of the Spanish sources only two fragments remain: one adjoining the Tarahumaras in the north, the other adjoining the Coras far to the south. Apparently the Tepejuanes once extended south from the Tarahumaras, where 1500 still remain, according to Lumholtz' brief mention.¹ Their extension reached its southern limits at the Sierra of Nayarit, where another fragment still remains² abutting on the territory of the Coras and Huichols. In the early colonial period Indians of this tribe were trained to ride horses for service as vaqueros (cow-men) on the haciendas.³ Equipped with a new and powerful mobility with the horse, the Tepejuanes began a series of wars against the Spaniards in the early 17th century⁴ in which the now pacific Tarahumaras participated. The Tepejuanes were successful, killing the clerics and driving out the hacenderos. But they were finally crushed by the military and their once extensive domain reduced to fragments in the extreme north and south. Tepejuane culture has largely been Mexicanized, though they may still retain enough of their language to merit linguistic and historical work among them.

The southern remnant of the Tepejuane,⁵ a fragment of the

¹Carl Lumholtz: Unknown Mexico, Vol. I, p. 423.

²Ibid., pp. 460-83.

³Fr. Padre Perez de Ribas: (El Triunfo de Nuestra Fe) writing in 1645 of the Tepejuane says, "They are very warlike, and cause their neighbors the Acaxee and Tarahumara much fear because they will raid their villages and take off their girls and women to abuse tyrannically. They use the same weapons, but are horsemen, since they have served as vaqueros and use the lance." P. 574.

⁴Carl Lumholtz: op. cit., p. 450.

⁵Ibid., pp. 473-83.

Tepecanos,¹ and a small island of Aztecs² fringe the Cora-Huichol country of Nayarit. These small groups have been considerably affected by the strongly aboriginal, strikingly original, but distinctly sub-Middle American culture of the Cora and Huichols. There are 2500 Coras and 4000 Huichols and through the work of Preuss³ and Lumholtz⁴ a good deal is known about the language, religion, and symbolism.

These Uto-Aztekan of the South Sierra region were more advantageously situated than those of the North Sierra (Tarahumaras) or of Sonora. Not only is rainfall more abundant and the terrain more hospitable and fertile, but also they were nearer the much more elaborated aboriginal culture of Middle America and its northwest extension as far as Sinaloa. The cultural stimulation from these centers of higher development seems to have found expression in the South Sierra largely in ceremonial and religious contexts.

The only adequate ethnographic knowledge for this area is of the Huichols who are described as practising the aboriginal upland milpa agriculture of corn, beans, and squash, using only the digging stick. The banana, maguey, guava, chile, etc. are known and used. Pottery is made, but weaving is preserved only in making girdles, ribbons, and pouches for which the false girdle-back loom and weaving-sword batten stick are used. Textile

¹A. Hrdlicka: op. cit., Vol. V., p. 385.

²Carl Lumholtz: op. cit.

J. A. Mason: "The Pinole Fiesta of Azquetlan," Univ. of Penn. Mus. Jour. No. 3.

³K. Th. Preuss: Die Nayarit Expedition, Leipzig, 1912.

⁴Carl Lumholtz: The Decorative Art of the Huichols
The Symbolism of the Huichol Indians
Unknown Mexico, Vol. II.

decorations are made by weaving and embroidery.

The religious life of the Huichols is rich, highly developed, and uses a considerable material paraphernalia. Much of the religion is impelled by the desire for rain, since abundant rainfall is necessary to water the steep sloping milpas. With rain is associated the deer, ritually killed, and peyote buttons, gained by a far ceremonial pilgrimage. Ceremonial arrows and "god-eyes" as prayers for rain correlate specifically with Pueblo practice. The "god-eye" is seen in continuous distribution through northern Mexico, appearing in north Arizona in early Pueblo archaeology.¹

Traits of Middle American source found in Huichol ceremonial contexts are: the teponastle, altars, temple chairs, reed banners, cakes as animal effigies, keeping of snakes, ceremonial drinking, human sacrifice, and rattle-snake idols.

3. The Affiliations of South Sierran to Sonoran-Sinaloan Culture

This analysis has given 102 traits for Sonora-Sinaloa of which 56 are common to the 98 traits of the South Sierra region. Thus 58% of the South Sierra traits show Sonora-Sinaloan affiliations, while the common traits are 56% of Sonoran-Sinaloan culture.

These figures may give a fair impression, but probably underestimate the degree to which South Sierra culture has developed beyond the fundamental culture patterns of Northwest Mexico due largely to a situation favorable for contacts with the higher cultures of southern Mexico.

¹Kidder and Guernsey: Archaeological Exploration in Northeastern Arizona, 1919, pp. 144-45, Fig. 64.

As a single expression of the degree of similarity between these two regions, A = 57%, G = 56%, while T falls below the means as 39%.

4. Affiliations of South Sierra and North Sierra Culture

Of the 136 traits of Tarahumara culture, 75 are found in the 98 of the South Sierra. Thus 55% of Tarahumara technological and material culture has affiliations to the south. The proportion of South Sierra traits in the north is 77%, which shows that Tarahumara is more like the South Sierra than visa-versa, since the latter received many elements from Middle America that never reached the Tarahumaras.

As a single statement for the degree of similarity, A = 66%, G = 67%, and T = 47%. These figures show that the South Sierran culture is distinctly more similar to the Tarahumara culture than to that of Sonora-Sinaloa. The distinctive common traits linking both Sierran regions are: the mecapal carrying strap, roasting ears, greens, girdles, ribbons, shell pendants, hair-nets, the atlatl, the false girdle-back loom, rope twister, coiled pottery, face painting, peyote-pilgrimage shaman's crystals, special ceremonial use of tobacco, god-eyes, the altar, feather head ornaments, incense, carved stone idols, and food offering.

V. The Tepic-Culiacan Sub-Province

1. Historical Data on this Aboriginal Sub-Province

The southern two-thirds of the Mexican State of Sinaloa and the coastal region of the State of Tepic form the Tepic-Culiacan sub-province of Sonoran Uto-Aztekan culture. Thomas and Swanton's map¹ shows this area as Nahuatlan, but Sauer and Brand's more thorough study of the scant linguistic data points to Sonoran rather than Nahuatlan affiliations in language.²

In this area no aboriginal culture remains as a functioning entity to give us any light on the culture that the Spaniards found. Aboriginal culture was almost completely wiped out since the area was "overrun in 1530-1531 by about as hard a gang of killers as Spain let loose anywhere in the New World."³ The fragmentary and casual historical record give the barest outlines of the culture. Data has been culled from the Spanish sources by Beals and Sauer and Brand. The latter account will be followed closely in an effort to give context to the statistical data of Beals.

In this sub-area there is no mention of irrigation, which was apparently unnecessary since the rich coastal plain yielded annually three crops of maize. The staple aboriginal plants,

¹C. Thomas and J. R. Swanton: Languages of Mexico and Central America, Bulletin 44, Bureau of Am. Ethnology, Washington, 1911.

²C. Sauer and D. Brand: op. cit., pp. 56-58.

³Ibid., p. 41.

maize, squash, and beans furnished the principal crops. An elaboration of aboriginal food-stuffs was available from chile, ciruelas, guavas, zapotes, and guamuchiles. The wild fruits are specifically of Middle American sources.

Besides the domesticated dog and turkey before met with, references to duck and other fowl are frequent. Numerous references to gallinas (chickens or hens) puzzle the ethnographer, as does a reference to a plain filled with cattle. A specific evidence of Middle American relationship is obvious in the presence of domesticated bees,¹ which are known to have been kept by the ancient Mayas of Central America.

Our area also yields the northernmost occurrence of the use of pulque, the characteristic Aztec beer made from the sap of the maguey (Agave sp.). Among the more primitive tribes both of the Sierra and of Sonora and Sinaloa, the sweet-cabbage of the heart of this plant was used for a beverage after cooking in the earth oven. The use of corn beer is more common in these marginal sub-areas.

The abundant wild food resources of the rich coastal plain were not neglected by the inhabitants of the Tepic-Culiacan region. Fish and shell-fish were used in great quantities. Weirs and traps were used to get the plentiful fish in amounts to have sufficed to "supply the population though there had been another Seville."² Alligators from the rivers were caught to provide leather for shields and other purposes. The wild pig or "jabali" yielded a leather "like cow-hide."

The manufacture of salt from sea water appears to have

¹Sauer and Brand: op. cit., p. 53.

²Ibid., p. 53.

been a large scale activity. In view of the importance of salt to the Indians of the interior, and the difficulty of obtaining it, more complete data is desirable for an industry which may have furnished an important source of inter-regional trade and commerce.

Cotton was cultivated throughout the Tepic-Culiacan region and appears to have been woven into jackets (camisas) and blankets. The aboriginal jacket is an elaboration of native clothing not before met with. A description other than that of the laconic narrators would be helpful.

Other sophistications in clothing are seen in this region which are more strongly suggestive of Middle American developments. In the town of Jalisco "the women wore something like a bishop's cloak with two large points, one in front and one behind. They were worked in blue and white." These are reported to be similar to the dress worn in Senispac and Acaponeta and even by the "Chichimec" Indians of the Sierra. The cloak was almost the same as was customary in Nicaragua.¹

"The plumage of birds was much used for personal decoration in particular for head-dress."² No details are forthcoming to show any possible affiliations of this feather work with the elaborated feather techniques and traits of Middle American culture. More sophisticated elements in personal decoration suggest Middle American affiliations: shells, pearls, gold, silver, copper bells, and turquoise. The latter two reached the Southwest, though copper bells are rare except in the Hohokam archaeology of the Gila River.

¹Op. cit., p. 54.

²Ibid.

There are detailed descriptions of the armament of the Indians of the Tepic-Culiacan region. Prominent weapons of offense were the bow, the lance, and the club, which is the weapon complex through Sonora as far north as the Pima and Yuman tribes. Wood-barbed arrows are a local specialization. The club of this sub-area follows the specialized macuahuitl pattern, being set with blades of obsidian. Similar blades were found in the archaeological sites.¹ This specialization is not met with farther north. For defense a round shield of withes was commonly used.

The men's carrying device all along the west coast of Mexico seems to be the carrying yoke in contrast to the macapal and breast strap of the Sierra. For this sub-area the carrying strap is described as being like a bow. For water transportation no reed balsas like those used by the Seri, southern Californians, and Paviotoso are reported for this sub-area. Rafts were made of two mats of cane and were given additional buoyancy by the use of gourd floats. "Gourds almost as large as shields were also used singly to hold bundles while the Indians swam across streams."²

In the Tepic-Culiacan area chiefs were carried in hamacas or sedan chairs of hammock-like arrangement. This appears specifically as a trait of the more elaborated cultures of Middle America.

Of the socio-political organization of this area, very little is known. A powerful chief is indicated by the use of hamacas. The early writers speak of the dwellings in the villages as being very close together (muy juntas). Even informa-

¹Op. cit., p. 33.

²Ibid., p. 55.

tion about house types is very unsatisfactory. Flat-roofed adobe houses are mentioned for the southern part of the area. A "jacal" type of dwelling is commonly reported. It is described as "very large and well constructed and covered with straw thatch skillfully made." A local architectural development is suggested by the record that "above the gables they had their devices of clay highly painted."¹ But no further information is forthcoming on this significant detail except that some of these figures are described as obscene to Spanish eyes.

Many of the houses were provided with the characteristic North Mexican architectural feature of a porch-like ramada or sunshade "under which the women do their spinning."² The Pima arbor is the northernmost occurrence of this element of "jacal" construction. It seems characteristic of the Sonoran-Sinaloan sub-area,³ where the early account of Ribas mentions them.⁴

The market, tiangué, is an important Middle American institution which is found as far north as in the Tepic-Culiacan sub-area. Exchange of cotton, clothing, fish, and fruit are reported for these markets. So important a socio-economic institution as the market is one of the clearest indications of the considerable degree of cultural development attained by the tribes of this sub-area. No record of such an institution is found for the remainder of the northwest Mexican area.

¹Op. cit.

²Ibid.

³Ralph Beals: "Aboriginal Survivals in Mayo Culture," Am. Anth., Vol. 34, p. 30.

⁴Fr. Padre Perez de Ribas: Historia de los Triunfos de Nuestra Santa Fe, p. 5.

2. Archaeological perspective

The archaeological evidence of the ancient culture in the Tepic-Culiacan area gives strong suggestion of much Middle American acculturation well back in the period called Toltecan.¹

In stone carving the remains are not highly rated. Significant, however, were lozenge-shaped idols of a dios niño cult, crudely carved. One excellent steatite figure was found, but no inkling of its significance is known. Carved stone bowls are few and unimpressive. They suggest possible affiliations as far north as the Hohokam of the Southwest, as do three-fourths grooved stone axes. Metates in this area are of the simple slab type of the Southwest; but are without specific significance of historical relationship.

This culture excelled in pottery of fine paste which is thin, tough, and very well polished. "Toltec" affiliations appear in their distinctive decoration by engraving rather than painting. Engraved patterns were colored bands, cut into the ground color or about colored designs. This technique is obviously related to the cloisonné of La Quemada and Chalchihuites, which we have traced as possibly trade interchange as far as Pueblo Bonito in the San Juan.

There was no realistic design in coloring or engraving. Realistic portrayals were secured by modeling the clay as is common in Middle America. Ball feet from tripod bowls and vases are specifically Mexican. Even more specifically of general "Toltec" affiliations are the terracotta figurines found as characteristic throughout Tepic-Culiacan sub-area. Figurines are of two types: the flat "gingerbread" type, often painted with

¹The only information comes from Sauer and Brand whom I follow closely, vite pp. 31-36.

red stripes, and a full fashioned type smaller than the former.

Other ceramic forms are:

1. Elbow pipes, always decorated in some manner, not uncommonly with an animal design, suggesting affiliations with Gamio's Chalchihuites material.

2. Decorated spindle whorls.

3. Perforated cylinders, presumably for stamping decorations on fabric or skin. These stamping devices range from Venezuela and Peru to Jalisco and the Huastecs. This occurrence therefore extends the known range of the type considerably northward.

4. Urn burials appear throughout the region. The urns were found to be as large as 2 feet in diameter.

In the Culiacan area, towns may have been built of mud houses. Occasional rows of foundation stones were found throughout the region to indicate the construction of walls necessitating a strong base. But the ruins differ markedly from the exposed Pueblo ruins of the Southwest. In the Tepic-Culiacan area "jacal" dwellings are indicated as more characteristic of the architecture than adobe.

Middle American relationships are probable in the mound construction characteristic of this sub-area. Mounds are thought to have served both for the protection of houses from floods and to have been developed for ceremonial purposes.

3. Affiliations of Tepic-Culiacan with the South Sierra

Despite the inadequacy of the fragmentary data, the sub-Mexican culture of Tepic-Culiacan shows itself strikingly divergent from aboriginal South Sierra culture of the hinterland in the mountains of Tepic. Among the 77 traits (a) of the Tepic-Culiacan sub-area, only 35 (c) are found among the 98 (b) of the south Sierra. The proportionate expression $P = \frac{c}{a} = 45\%$,

while $P_1 = \frac{c}{b} = \frac{35}{98} = 35.7\%$ shows an even lower relationship

when based on our more adequate data from the South Sierra. The arithmetic mean (A) of these proportions is 40.3%, while the geometric mean (G) is 43.2%. The other single statement of this low correspondence between these two cultures is $T = \frac{c}{a + b - c} =$

$$\frac{35}{98 + 77 - 35} = 25\%.$$

These are the lowest mean values yet obtained, and probably give a fair statement of the greater degree of cultural differentiation between the South Sierra as typified by the Huichols and the sub-Mexican region of Tepic-Culiacan which extended from the coast of Tepic north through most of Sinaloa. The traits in common only between these two areas are: the cultivation of agave, temples, silver, gold, and the atlatl. If material on Tepic-Culiacan were comparable in volume to that on the Cora and Huichol, other distinguishing traits might appear to indicate other common Middle American affiliations.

4. The Affiliations of Tepic-Culiacan with Sonora-Sinaloa

The sub-Mexican province of Tepic-Culiacan shows a still lower degree of cultural similarity with the Cahita province

of Sonora-Sinaloa which comprises the Yaqui, Mayo, and Opatá tribes. Among the 77 traits (a) of the Tepic-Culiacan sub-area only 27 (c) are found in common with the 102 traits (b) of Sonora-Sinaloa. $P = \frac{c}{a} = \frac{27}{77} = 35\%$ gives an expression of the common

traits in Tepic-Culiacan culture. This figure is distinctly lower than the 45% expression of the relationship of Tepic-Culiacan and the south Sierra hinterland. The proportionate expression $P = \frac{c}{b} = \frac{27}{102} = 26\%$ shows more clearly the sharp break between

the sub-Mexican province of Tepic-Culiacan and the Cahita province of Sonora-Sinaloa. The figure is based on our more adequate knowledge of the Sonora-Sinaloa sub-area. This expression is again lower than the corresponding 37.5% statement of relationship between Tepic-Culiacan and the South Sierra. For single expressions of the affiliations of Tepic-Culiacan and Sonora-Sinaloa, $A = 30\%$, $G = 31\%$, and $T = 18\%$. In each case values are distinctly lower than the corresponding expressions of the relationship between Tepic-Culiacan and the South Sierra, namely 40.3%, 43.2% and 25%. The traits found only in these two sub-areas are: the carrying yoke, organized warfare, the game of pelota, and the use of flat roofs.

5. The Distinguishing Traits of the Tepic-Culiacan Sub-area

The traits that distinguish the Tepic-Culiacan sub-area from both the South Sierra and Sonora-Sinaloa will be seen mostly to represent more sophisticated Middle American elements: the sweet-potato, alligator pears, cotton armor, cremation, rafts of calabash, the atabale or kettle-drum, palisades, the litter, the mat house, domesticated ducks, domesticated bees, large-scale

salt making, alligator skin leather, jabali (wild pig) leather, cotton jackets, feather capes, and pearls.

The archaeology of the region shows a similar character indicating Middle American affiliations. Relationships are also apparent with the "Toltec" ruins of La Quemada and Chalchihuites of the South Sierran region, but these special relationships do not extend to the present South Sierran tribes.

SUMMARY OF SONORAN UTO-AZTEKAN
CULTURE PROBLEMS

The fact of the genetic relationship of the Sonoran Uto-Aztekan languages proves the historical existence of a common language and hence a common culture that once underlay the present diversity of culture in aboriginal northwest Mexico. The hypothesis is tentatively presented that this cultural diversity represents developments from variants of "proto-Uto-Aztekan" culture allied to the Basket-Maker remains of the Southwest. Such remains have been found in southern Chihuahua suggesting that this culture may have been introduced into northwest Mexico by the Sonoran Uto-Aztekan.

Archaeological evidence of this cultural sub-stratum is found in the northern segment of Sonoran Uto-Aztekan distribution, as might be expected in view of a southern migration of all these peoples. In this same general northern sector, the Pima-Papago until recent times have preserved elements which suggest that their culture survives from this ancient simple Basket-Maker culture rather than as a degenerate form of the elaborate Casa Grande culture.

From an original similarity the present cultures have sufficiently differentiated to justify classification into five sub-areas: Pima-Papago; Sonora-Sinaloa; North Sierra (the Tarahumara); South Sierra; and Tepic-Culiacan. A tabular analysis of the material culture of the Sonoran Uto-Aztekan has been presented (see pages 190 ff.).

Similarity in the Material Cultures of the
Sonoran Uto-Aztekan Sub-areas Expressed
by Statistical expressions of Association

An objective conception of: (1) the amount of drift of the modern cultures from their original sub-stratum; and (2) the historical interrelations of the sub-areas may be expressed by Driver and Kroeber's¹ simplified expressions of Association. Stated in percentages these statements show the degree of similarity exhibited by these cultures at the present time.

	P ₁	P ₂	A	G	T	
The similarity of Pima	50%	79%	65%	61%	43%	to Papago
The similarity of Pima	50	59	55	52	37	to Sonora-Sinaloa
The similarity of Tarahumara	44	59	51	50.5	34	to Sonora-Sinaloa
The similarity of Tarahumara	43	49	46	47	29	to Pima-Papago
The similarity of South Sierra	77	55	66	67	47	to the North Sierra (Tarahumara)
The similarity of South Sierra	58	56	57	56	39	to Sonora-Sinaloa
The similarity of Tepic-Culiacan	45	35.7	40.3	43.2	25	to South Sierra
The similarity of Tepic-Culiacan	35	26	30	31	18	to Sonora-Sinaloa

¹H. E. Driver and A. L. Kroeber: "Quantitative Expressions of Cultural Relationships," 1932, UCFAAE.

The Sonoran Uto-Aztekan as Bearers of the Cultural Exchange
Between the Southwest and Middle America

To judge by the distributional evidence the debt of the Southwest to Middle American culture is general rather than specific.¹ Important but isolated Mexican traits passed through the region of the Sonoran Uto-Aztekan, reaching as far north as the Pueblo area. These traits were given local and characteristic treatment throughout their continuous distribution; and among the Pueblo peoples many of them now function in a thoroughly indigenous context, very different from that at the source.

Important general similarities in the culture of Middle America and the Southwest, such as the high development in religion and the corn complex, has probably lead to an overemphasis in ethnological literature on cultural borrowing between the two regions. A careful search for specific structural similarities in complex cultural traits seems to prove that cultural borrowing from the south has been much less prominent in the Southwest than the results of local development.

The northern course of strong currents of Middle American influence (see p. 238 ff.) were blocked by the Cahita peoples of Sonora-Sinaloa and by the Tarahumaras of the North Sierra. Beals says of the former, "the Cahita in particular offer a puzzling problem as there apparently was a pronounced drop in culture between Old Sinaloa and the Culiacan region to the south."²

¹A. L. Kroeber: "Historical Reconstruction of Culture Growths and Organic Evolution," Amer. Anth. n.s. Vol. 33, No. 2, 1931. This essay sets up the criteria for historical reconstruction which have been used in this paper.

²Ralph Beals: The Comparative Ethnography of Northern Mexico before 1750, 1932, p. 149.

From the evidence of archaeology and the modern culture of the Tarahumara, the present author found that the North Sierra apparently had been an insuperable obstacle to any appreciable influence of Middle American culture. Thus these Sonoran Uto-Aztekan do not appear to have been important bearers of culture exchange between Middle America and the Southwest.

The whole superstructure of Pueblo culture appears to have been built on the corn complex of Mexican derivation. Yet cultivation by the Pueblo Indians is not by the wasteful "milpa" system characteristic of tropical Middle America. Intensive dry farming supplemented by irrigation is necessary for corn-bean-squash agriculture in the arid Southwest. In the agricultural complex only a sword-shaped hoe yields the structural similarity necessary to posit specific historical relationships throughout its continuous distribution.

The Southwestern techniques of food preparation and pottery are mostly local specializations. The elaborate Middle American metate is simplified to a slab throughout the Southwest; and Mexican tortillas show a specialization in the wafer bread of the Pueblos. Coiled pottery appears as a local Southwestern development, possibly stimulated by general Mexican conception of coiling, tempering, and paste. But the paddle-anvil pottery of the Hohokam, as well as its decoration, is probably directly affiliated with Sonoran techniques. Because of the wide expanse of desert from the Hohokam (and Casas Grandes) to La Quemada and Chalchihuites (distinctly sub-Middle American sites) the similarities in pottery decoration appear to have been carried by trade. Certainly the surviving tribes of the region show no evidence of a strong wave of Middle American diffusion ever having reached so far north. The cultivated

dipper gourd may be an aboriginal Mexicanism which entered the Southwest possibly with corn, in Basket-Maker II. The double core fiber brush is another specific Mexicanism in Basket-Maker II.

The Southwest seems to be indebted to Middle America for several textile techniques. The basketry technique of twill appears as a diffusion from Mexico in early Pueblo times. Twilled mats, the Aztec petatl, show a continuous distribution through the Sonoran Uto-Aztekan as far north as the Pueblos. Textile weaving using wild fibers, such as the yucca and agave, may be an aboriginal Mexicanism that entered the Southwest in Basket-Maker II times. The use of cotton for weaving is a later Mexican introduction, probably through Sinaloa and Sonora. The appearance of sandals and men's clouts in the earliest Basket-Maker remains suggest that the former may be an indigenous trait in the Pueblo costume, and that the second is a very early introduction from Mexico. Distributional evidence indicates that the kilt-skirt for women and the blankets are probably later traits from Mexico. The woven girdle, still preserved by the Hopi, may be a much later introduction related to the post-Hispanic girdles of the Huichols and Tarahumaras.

The Pueblo house type is unique, but elements in it probably represent borrowing from Mexico. The manufacture of adobe brick is a definite and specific technique that shows evidence of borrowing by a continuous distribution from the Valley of Mexico through the Sonoran Uto-Aztekan to the Southwest. The mud-wattle and "jacal" house types of the marginal Southwest tribes may be related to the earliest Pueblo I house, perhaps carried from the Southwest into northern Mexico by the Sonoran Uto-Aztekan among whom these types are common.

The influence of Mexican patterns on the social political, and religious culture of the Southwest is outside the scope of this paper. Mexican and Southwestern sociological patterns have so little in common that could be attributed to diffusion that it is doubtful if many specific socio-religious borrowings could be established. The religious concept of the cardinal points with definite color symbolism is a trait so specific and complex that its continuous distribution suggests Southwestern culture borrowing from Middle America.

Ceremonial paraphernalia show several traits in continuous distribution indicative of borrowing. The prayer-sticks of the Pueblos have a context so similar to the ceremonial arrows of the Huichol that some historical relationship seems certain in view of the presence of these traits throughout the Sonoran Uto-Aztekan area. Archaeological evidence does not permit a conclusive opinion as to whether the borrowing was from Mexico or visa-versa. The "god-eye" (see p. 231) is another ceremonial trait offering sufficient structural complexity for positing definite historical contacts. Since the "god-eye" occurs in early Pueblo archaeology, it possibly represents an ancient Southwestern trait that was introduced into Mexico, even though its greatest cultural prominence is in the South Sierra, as among the Huichols.

A few traits are of such wide distribution beyond Mexico and the Southwest, that their continuous distribution throughout these regions is not conclusive of historical relationships. Such traits are: the spear, masks, and captive eagles.

The list of traits offering satisfactory evidence of diffusion between Middle America and the Southwest is not large. The conclusion is that although contacts with Mexico have been

an important factor in the development of Southwestern culture, still they are minor to the factor of local development based either on these borrowings or upon independent inventions.

Except for the Huichols, the Sonoran Uto-Aztekan appear to have been passive intermediaries for the Mexican traits, many of which were given strikingly original elaboration in the strongly independent cultural growth of the Pueblos in the Southwest.

The Relation of Surviving Sonoran Uto-Aztekan Culture to
the Archaeological Remains

The ancient remains of Casa Grande and Casas Grandes do not reveal a culture that has survived among the northern Sonorans. The surviving tribes appear to have been marginal mountain peoples whose cultures show almost no evidences of stimulation of the ancient elaborations. Both of these northernmost ruins in the area of Sonoran linguistic distribution seem to represent a cultural development related to that of the Southwestern Pueblos. Casa Grande is a development from a "jacal" house phase, comparable to Pueblo I. Casas Grandes reveals a Cliff-house phase probably preceding the "Big House" phase. While showing more evidences of Mexican influence in architecture, arts, pottery decoration, etc., these ruins appear as a southern segment of the American southwestern culture stimulated by Mexican trade contacts, rather than an isolated fragment of Mexican aboriginal remains. There was a prehistoric route of aboriginal trade in turquoise and parrot feathers that went up the west coast of Mexico, through the region of Casa Grande, extending as

far north as Pueblo Bonito in the Chaco. This long continued trade contact may adequately account for the slight Mexican cast of Casa Grande culture.

Chalchihuites, La Quemada, and the archaeological horizon of Tepic-Culiacan show a high degree of Middle American influence. This sub-Mexican material may be termed "Toltec" as a classificatory designation to include the following Middle American traits found in these sites:

1. Truncate and set-back pyramidal temple bases
2. Ball court
3. Rooms of columns
4. Paved avenues
5. Sunken patios
6. Apartments with stairways
7. Cloisonné pottery decoration
8. Mosaic-work in turquoise, beryl, and steatite
9. Elbow pipes, often with effigies

The isolated situation of the first two of these sub-Mexican sites in the Sierra about half-way between the Valley of Mexico and the North American Southwest may prove of great significance for an understanding of the historical contacts between the two regions--but archaeological excavation alone can solve these specific problems.

Sonoran Uto-Aztekan Relationships with Middle American Culture

In the sub-Mexican sites of Chalchihuites and La Quemada, evidence of fortified structures agrees with the other data to indicate a probability that they may be remains of isolated and defensive colonies or frontier outposts of the peoples of higher culture from the Valley of Mexico or more likely of the "Toltec" province of Tepic-Culiacan to the west.

The Tepic-Culiacan sub-area as far north as most of Sinaloa proves to have been a continuous northern extension of a sub-Mexican culture. The evidence of this is unmistakable both in the historic record of this culture as well as in its archaeological remains. Since the evidence is that this is a Sonoran Uto-Aztekan area, these sub-Mexican affiliations point to a northern infiltration of Middle American culture, rather than to a late colonization from the highlands to the south. Sauer and Brand consider the depth of the archaeological material to indicate that this area acquired its higher culture well back in the period that is called Toltecan.

From this interpretation questions arise that cannot be solved in the present state of knowledge. If the data were conclusive that this was a Sonoran Uto-Aztekan area, was this sub-Mexican area of "Toltec" affiliations the point of departure of the Nahuatlan Uto-Aztekan of Jalisco and those tentatively identified with the Toltecs of the Valley of Mexico?

The line of demarcation between the Sonoran and Nahuatlan Uto-Aztekan appears to cross Jalisco. Presumably the Nahuatlan peoples entered the Valley of Mexico through Jalisco, where a great many archaeological remains attest to an ancient culture of high degree of sophistication. While linguistic data are poor, archaeological knowledge is even more inadequate. Archaeological data come from Lumholtz' survey of Tepic and Jalisco.¹

It seems certain that Tepic-Culiacan received early a strong cultural stimulation from the aboriginal civilizations

¹Carl Lumholtz: Unknown Mexico, Vol. II, p. 313. Lumholtz is misleading in seeming to say that this material is Tarascan with much Nahuatl influence, as in the same paragraph he admits his inability to find any strong Tarascan similarity in the ceramics of Tepic and southwest Jalisco.

of Middle America. In this area it would appear that the southern thrust of Uto-Aztekan peoples came under this influence and took over many traits of a simplified Middle American culture possibly before the complete differentiation of Sonoran and Nahuatl languages, probably as long as a thousand years ago.

The Nahuatl Uto-Aztekan continued their southern course from Tepic through Jalisco into the Valley of Mexico. As the Nahuatl approached the higher civilizations of Middle America they took over more of this elaborated culture, judging by evidences of distinct sophistication in the Toltec remains, and the Spanish record of the civilization of the Aztecs in the region of Mexico City.

CONCLUSIONS

It may be concluded from this summary of data that the Sonoran Uto-Aztekan peoples entered northwest Mexico with a variant of "proto-Uto-Aztekan" culture allied to the Basket-Maker remains of the Southwest. While our only archaeological remains of this culture shows the presence of corn, the modern Pima-Papago show no evidence of a corn complex articulating throughout their culture. This agrees with other considerations to indicate that the Sonoran Uto-Aztekan movement met a northern diffusion of corn from the south. Other Southwest traits that passed through the Sonoran Uto-Aztekan in Basket-Maker times are: cultivated dipper gourds, the double core fiber brush, the twill basketry technique, true weaving, and sandals. From the evidence of Southwest chronology this would have been before

the beginning of the Christian era which saw a Uto-Aztekan distribution from northern Mexico to northern Nevada.

The development of Pueblo culture carried over into the northern sector of the Sonoran Uto-Aztekan to culminate in Casa Grande and Casas Grandes. It is clear that the Casa Grande was a local development from a pit-house phase called Colonial Hohokam. The house pits and excellence of pottery suggest that Mimbres development in the Southwest was an offshoot from Hohokam. Both these "Big House" cultures represent cultural developments independent of the Pueblos but influenced both by it and by more numerous contacts with Mexico.

This northern cultural development shows surprisingly few affiliations with the main stream of Sonoran Uto-Aztekan culture history. The present distribution of these tribes shows a slight but steady increase in cultural sophistication southward from the Cahita (Sonora-Sinaloa) and Tarahumara (North Sierra) sub-areas to the South Sierra. Here modern Cora-Huichol culture shows distinct advance due both to better environment and a situation more favorable for borrowing from the South.

The sub-province of Tepic-Culiacan yields historical data and archaeological remains of a northern salient of a distinct sub-Mexican culture. The "Toltec" remains of La Quemada and Chalchihuites in the mountains to the east may prove an outpost or a colony from this sub-area. On the coast this culture extends back to the period called Toltec in the Valley of Mexico. This opens the suggestion that it may have been the cultural homeland from whence came the Nahuatlans Toltecs who passed through Jalisco into the more highly acculturated Valley of Mexico.

Problems and Prospects in Uto-Aztekan

History

The problems in the cultural history of the Toltecs and Aztecs should be included in a reconstruction of Uto-Aztekan history; but these problems have attracted many other workers. The spear-point of the Uto-Aztekan movement was furnished by the Nahuatlan peoples who occupy the region of the Valley of Mexico and extend southward into Central America.

General considerations of linguistic distribution and Nahuatlan place names throughout southern Mexico indicate that the people known in Aztec legends as Toltecs were Nahuatlan. They probably passed through Jalisco with a cultural equipment already influenced by a marginal variant of the northern radiation of Middle American culture (see p. 240-41). These people were drawn toward the higher centers of cultural development and extended themselves through the highlands of Mexico and into Central America, where their descendants are the Pipil, Niquiran, and Sigua.

In the Valley of Mexico the Toltecs developed the sophisticated culture known from the Aztec legends and in the archaeological sites of Teotihuacan, Cholula, and Tula. The Toltecs appear to have entered Central America, and in Yucatan impressed elements of their culture on the New Empire of the Mayas. Architecture, arts, and the religion of the New Empire bear the impress of the Toltecs, and suggest that the latter may have come into Yucatan as conquerors.

The Aztecs appear to have been relatively late arrivals

in the Valley of Mexico. Not fierce, warlike Chichimecan¹ peoples with a semi-nomadic culture, they appear to have already taken over much of the rudiments of Middle American civilization, even before their separation from the Sonoran Uto-Aztekan. After a passage through Jalisco and Michoacan, in which they developed many of the distinctive features of Aztec culture, their war-like genius enabled them to establish over most of southern Mexico a rigorous and cruel Pax Azteca which was seen and recorded by the Spanish conquerors.

If the Aztec legends of their "chichimecan" antecedents have any historical value, it is not inconceivable that they may represent a variant of "proto-Uto-Aztekan" culture. Its record may someday be found in archaeological caves of the northern Sierra of Mexico. Variants of Basket-Maker culture have proved so ancient and so consistent a cultural sub-stratum of western North America it may not be too naive to suggest the possibility that a corresponding amount of archaeological work in northern Mexico might give reason to think that Aztec "chichimecan" culture may be related to the Rio Fuerte Basket-Maker of southern Chihuahua.

In the wide area of the distribution of Uto-Aztekan languages extending over 1700 miles, archaeological remains distributed over 1100 miles in the Basket-Maker horizon yields evidence of "proto-Uto-Aztekan" culture. This sub-stratum has shown relationships with the lowly "digger" culture of the Shoshoneans, and furnished the sub-stratum for Hopi Pueblo culture, the first peak in the bimodal picture of modern Uto-Aztekan culture. Is there any basis for the speculation that the same

¹Paul Radin: "Sources and Authenticity of History of the Ancient Aztecs," UCPAAE, Vol. 17, p. 141.

sub-stratum was the basis for historic Aztec culture, the second peak in the bimodal curve of Uto-Aztekan culture-history?

On the assumption of a southern migration of the Uto-Aztekan tribes, the 600 miles separating the modern Aztecs from the southernmost occurrence of archaeological Basket-Maker material is not an impossible break considering the two thousand year interval separating the "proto-Uto-Aztekan" material of Chihuahua and the Aztec culture of the Valley of Mexico.

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Abbreviations

- AA American Anthropologist, old series.
- AA ns American Anthropologist, new series.
- M AAA Memoirs American Anthropological Association.
- Pro AAAS Proceedings American Academy Arts and Sciences.
- AMNH Bull. American Museum of Natural History, Bulletin.
- AMNH J American Museum of Natural History, Journal.
- AP AMNH Anthropological Papers, American Museum of Natural History.
- M AMNH Memoirs American Museum of Natural History.
- BAE AR Bureau American Ethnology, Annual Report.
- BAE Bull Bureau American Ethnology, Bulletin.
- CGS Canada, Department of Mines, Geological Survey, Publications.
- HAV Holmes Anniversary Volume, 1916.
- JAI or
- JRAI Journal (Royal) Anthropological Institute.
- JAFL Journal American Folklore.
- Pro ICA Proceedings of the International Congresses of Americanists.
- INM Indian Notes and Monographs.
- SI AR Smithsonian Institution, Annual Reports, Washington.
- Pro SI Proceedings of the Smithsonian Institution.
- SMC Smithsonian Miscellaneous Collections.
- SWMP Southwest Museum Papers, Los Angeles.
- PPMAAE Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Cambridge, Mass.
- UCPAAE University of California Publications in American Archaeology, Ethnology and Linguistics.
- UPMJ University of Pennsylvania, Museum Journal.
- USNM AR United States National Museum, Annual Report.
- USNM Bull United States National Museum, Bulletin.
- Pro USNM Proceedings United States National Museum.

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